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SKETCHES OF INDIAN INDUSTRIES.

VOL. I.

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BY
AN INDUSTRIALIST



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INDUSTRY BOOK DEPT.
KESHUB BHABAN
SHAMBAZAR, CALCUTTA.

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INDUSTRIAL SITUATION IN INDIA

REVIEWING the industrial situation of the country, the Indian Industrial Commission after an enquiry extending over two years arrived at the conclusion that 'the industrial development of India has not been commensurate with the size of the country, its population and its natural resources' The finding has since gone unchallenged Yet history tells us that there have been times when the manufactures of the country attained a high degree of excellence and were well known beyond its borders India was at one time famous for the high artistic skill of her craftsmen and it was not until the industrial revolution of the 18th century that she began to fall behind in the industrial sphere, and with it developed the erroneous idea that the tropical countries with their naturally fertile lands and trying climate were suited to the

production of raw materials rather than the finished products

INDUSTRIAL ACTIVITIES IN ANCIENT INDIA

History goes to prove that from an early era India was a *manufacturing country* and Indian manufactures used to find a ready market everywhere in the civilized world. The Indian Industrial Commission has paid glowing tribute to the industrial developments in India in the past. In the course of its stupendous report it remarks, "At a time when the west of Europe, the birth place of the modern industrial system, was inhabited by uncivilized tribes, India was famous for the wealth of her rulers and for the high artistic skill of her craftsmen. And even at a much later period when merchant adventurers from the West made their first appearance in India the industrial development of this country was at any rate, not inferior to that of the more advanced European nations."

EXCELLENCE OF COTTON FABRICS

The skill of our ancestors found greatest expression in the *production of delicate woven*

fabrics and in the mixing of colours to weave an ornamental background Independent authorities aver that the arts of cotton spinning and cotton weaving were in a high state of proficiency thousands of years ago *Murray* testifies that the fabrics were the most beautiful that human art had anywhere produced and were sought by merchants at the expense of greatest toils and dangers Antiquarians are of the opinion that Indian cotton found its way to Assyria and Babylon in the remote past Mummies in Egyptian tombs have been found wrapped in muslins of the finest quality Later on the muslins of Dacca became known to the Greeks while there was a very large consumption of Indian manufactures in Rome

OTHER TECHNICAL ARTS

The manufactures of ancient India were by no means restricted to artistic cotton products alone *Prof Weber* remarks that the skill of our ancestors in the working of metals and precious stones the preparations of essences and in all manner of technical arts has from early times enjoyed a world wide cele

brity Indigo which is peculiarly an Indian produce has been detected on ancient Egyptian cloths

“The riches of India, such as spices, perfumes, jewels, and other goods were known to the civilized world as long ago as the days of King Solomon, when they were carried by traders through the Red Sea to Asia Minor and elsewhere, and at a later date the Phoenicians of old were among the principal purchasers of these indigenous products Notwithstanding the turmoils during the centuries which saw the rise and fall of dynasties and the successive control of the seas by the Portuguese, Dutch and other nations, India still remained the market in which the above-named and other costly articles were obtained for the courts of European kings ”

IRON INDUSTRY IN ANCIENT INDIA

To cite only one example, the iron industry not only supplied all local wants, but it also enabled India to export its finished products to foreign countries The quality of the material turned out had also a world-wide fame “The famous Iron Pillar near Delhi,

which is at least fifteen hundred years 'old, indicates an amount of skill in the manufacture of wrought iron, which has been the marvel of all who have endeavoured to account for it. Cannons were manufactured in Assam of the largest calibre: Indian *wootz* or steel furnished the materials of which Damascus blades with a world-wide reputation were made; and it paid Persian merchants in those old times to travel all the way to India to obtain these materials and export them to Asia. The Indian steel found once considerable demand for cutlery even in England." (*Ranade*). There is also authentic record to show that the manufacture of steel and wrought iron reached a high degree of perfection at least two thousand years ago.

TRADE AND INDUSTRIES IN MEDIEVAL INDIA.

Coming to more recent times we find ample evidences that Arabian merchants carried on a brisk trade with India and much of the spices and precious stones, ebony, gold and embroidered work with which they supplied the western world came from India. It may be noticed in this connection that due to the

difficulties of communication trade of ancient India was confined to costly and curious articles and the balance of trade running in India's favour was usually met by large imports of gold

INDUSTRIES DURING MOGHUL PERIOD

Arts and industries reached the highest pinnacle of glory during the Mahomedan suzerainty Chinese and foreign travellers who visited India at that time admired her wonderful arts, industries and manufactures *Bernier*, who visited India in the reign of Shahjehan, marvelled over the "incredible quantity of manufactured goods such as embroideries, streaked silks, tufts of gold turbans, silver and gold cloth, brocades, network of gold," etc *Tavernier* also gives a long description of the manufactured goods and dwells with wonder on the marvellous peacock throne, with the natural colours of the peacock's tail worked out in jewels, of carpets of silk and gold, satins with streaks of gold and silver, endless lists of exquisite works, of minute carvings and other choice objects of art The Moghul Emperors highly

encouraged the arts and industries and established State factories or *karkhanas*. Evidences exist to show that Northern India came to occupy a dominating position in the international trade of that period and entered into closest trade relations with Kabul and Kandahar whence the articles of trade were distributed to European countries. Indian articles found easy sale in Venice whither these were exported *via* Constantinople. The industries of the Southern India were also in a flourishing condition, the local exports by sea comprising precious stones, muslins, cotton fabrics, ivory, ebony, pepper and silk.

THE DECADENCE OF INDIAN INDUSTRIES

The discovery of the sea-route to India *via* the Cape of Good Hope changed the whole phase of Indian trade and industries. Trade now gravitated into the hands of the Europeans especially the Dutch, the English and the French. They frequently halted in India during their business adventures to the Far East and gained important concessions in the shape of low customs duties, free lands, freedom from inland transit duties, etc. The

internecine struggles for supremacy following the break down of the Moghul Empire dragged the indigenous industries to the lowest ebb of depression. The British nation rose into power and came to dominate over the destiny of India. This almost synchronised with the replacement of the Indian manufactures by British ones. The fiscal and administrative policy of the East India Company has been scathingly condemned by all unbiassed authorities as inimical to the best interests of the country, and is directly and indirectly responsible for the ruin of the chief of the Indian industries such as cotton, salt and shipping. To treat of the cotton industry, "even at the end of the seventeenth century," says Lecky, "great quantities of cheap and graceful Indian calicoes, muslins, chintzes were imported into England, and they found such favour that the woollen and silk manufacturers were seriously alarmed." Coming to more modern times "in the first four years of the nineteenth century," says Mr Romesh Ch Dutt, "in spite of all provisions and restrictive duties, six to fifteen thousand bales of cotton

piecegoods were annually shipped from Calcutta to the United Kingdom. After 1829 the manufacture and export of cotton piece goods declined steadily, never to rise again."

Attempts have been made by British economists to trace the cause of the decline of the Indian textile industry. By way of explanation they refer to the industrial revolution in England in 1770 and the invention of labour saving machines as responsible for the sudden collapse of Indian cotton industry. But those who are in the know would bear out that the indigenous industry survived all these onslaughts such was its inherent strength. The introduction of free trade policy in India, at the dictates of the superior will of the British Board of Directors was followed by the rapid destruction of such small industries as had existed in the country. This being further supported by cheap transport charges for sending imported goods up country, by easy facilities offered for goods carried in British bottoms and by varied restrictions on the Indian ships carrying Indian goods dealt a stunning blow to the Indian industries.

GENESIS OF "AGRICULTURAL" INDIA

Other industries being exposed to the competition of foreign made goods also pined like the cotton industry. The opening of new countries and linking them up by railways and telegrams changed the whole aspect of the country. In the absence of the encouragement of local princes Indian industries were in an indifferent position and failed to keep up against the foreign aggrandisement. The exports of raw products were encouraged while the imports of manufactured goods assumed high proportions. The internal trade suffered in favour of the external trade. The artisans were thrown out of employment and found no avenue whither to direct their energy. Naturally the people began to steadily press more and more upon their last resource, *viz* agriculture, which is now a days called upon to support the majority of the population who are only partly employed for want of suitable occupation. This is the genesis of the current story that India is traditionally an agricultural country.

THE SAD PLIGHT OF INDIGENOUS INDUSTRIES

The present industrial position in India is by no means rosy. In the words of Dr Annie Besant "In India of to day we have reached a point lower than ever. The manufactures of silk, muslin, carpet, which formed the wealth of the nation and enabled it very largely to draw to itself what it wanted has almost disappeared. In the middle ages there was an immense trade between Europe and India, and that trade was composed of those valuable articles which were sold for their weight in gold. Of to-day the people have acquired a vicious taste, a taste for articles which do not last, although they glitter and are fashionable."

The old industrial order has undergone a thorough change. The last century saw the debacle of the Indian manufacturing industries. The industries which were once the glory of the ancient India have decayed but the fact that the industries have survived to this day revives new hopes of resuscitating them by organised labour. There is to be found scattered unorganised and handicapped

by antiquated methods of marketing and finance that hardly permit them to rise above the lowest economic level, a variety of cottage industries. The economic conditions of those engaged in industries show sign of appalling poverty, they can hardly make the both ends meet and give their children the best of education in their hereditary profession. Skilled labour is getting scarcer and scarcer year by year. India is importing immense quantities of manufactured goods while she has all necessary raw materials at her own doors. She is receiving her raw materials back again in the shape of manufactured products which she can herself manufacture to the great benefit of her own sons.

THE NEW INDUSTRIES

Though the old type of industries is almost subdued it is a happy sign of the times that modern industries have sprung into being, the chief of which are cotton and jute mills. Iron and steel industry has made marvellous progress recently. New rolling stock is made in a number of the principal railway workshops. There are a number of general engi-

neering shops of some importance. Electrical engineering and generating works are steadily expanding. The manufacture of the ubiquitous kerosene tin employs an increasing number of persons in, or near, the three Presidency towns and iron foundries, generally on a small scale, are widely distributed. Engineering shops for the upkeep of the tramways, telegraphs, motor transport and shipping are also growing in importance.

Besides these, a wide and constantly increasing range of industries is scattered over the whole of India but is naturally concentrated chiefly in the larger towns. The large scale factories include paper mills (mainly in Bengal and Bombay), cigarette factories (especially in Bihar and Bangalore), petroleum refineries (in Burma), woollen mills (in Bombay, Cawnpur and the Punjab) and a few tanneries (in Cawnpur and Madras). Match and sugar factories are widely scattered while the saw mills work mainly in Burma. Chemicals, soaps, perfumery, hardware, steel trunks, medicines, etc. etc. form the new lines of industrial activity.

THE SWADESHI AGE

Industrial developments in India except in the case of the textile industry during the past half a century has been brought about principally through the force of outside influence. The jute tea coal and many of the so called big industries were started with European capital under European management. It was not till the now well known Partition of Bengal that a tide of national and industrial consciousness swept over the country. The popular indignation at the official apathy towards the sentiments of the people led to the inauguration of the Swadeshi Age in India and took the form of boycott of British goods. The movement roused considerable enthusiasm among the middle classes who saw in industrial development a new field of employment. Indian goods came to be in increased demand and a number of small factories were started especially for the manufacture of piecegoods soaps matches pencils cutlery etc. Bengalees played the leading part in the industrial movements but the movement resulted in numerous failures. Most of the promoters

lacked business ability and industrial experience. Want of sufficient capital and skilled labour and the pursuance of a strictly *laissez-faire* policy on the part of the Government were not a little responsible for the failures.

DURING THE WAR

During the War, however, Indian industrial position underwent a remarkable change. The supply of foreign stores was cut short while there was a great demand for various finished products for the British army in the various theatres of war. The country and the Government of India too realised the danger of too much dependence on foreign stuff and the urgency of establishing some of the key industries for which the facilities in the country are immense was generally perceived.

A number of new industries were founded in succession. The railway and engineering workshops came into being under the direct patronage of the Government. Chemical, iron and steel and similar industries had their hands full. Hosiery, steel trunks, paints, soaps, pencils, leather goods, confectioneries, sporting goods, ceramics, buttons,

paper, etc , came to be increasingly manufactured in the country Rice, flour and oil mills multiplied to which power was newly applied Glass, sugar and indigo factories were started As soon as the war was over, the demand for the diverse commodities of commerce slackened and the industries had a very bad time of it Unfortunately the Government also withdrew the pledges made to the manufacturers regarding the purchase of the output of some of the companies at a reasonable price

AFTER THE REFORMS

The advent of the Reforms and the inauguration of autonomy in fiscal matters permitted a thorough enquiry being made by the Indian Fiscal Commission The Commission recommended a principle of discriminate protection to a number of industries which are likely to satisfy certain conditions The chief criteria were that (1) there should be natural facilities for conducting the industry (2) the raw materials for the industry are readily available in sufficient quantities, (3) the industries are likely to stand unaided in competition with other industries when the pro-

tection on other industries are withdrawn after a number of years. In response to the applications made by certain firms for protection, the Tariff Board which was created as a result of the recommendations of the Indian Fiscal Commission investigated the claims, specially of the iron and steel, chemicals, paper, textiles, match industry, manilla hemp, printing types, electric wires and cables, salt, methylated spirit, sugar, gold and silver thread, etc., etc.

THE MENACE OF FOREIGN CAPITAL

One of the recent developments in India is the advent of the foreign companies and the outpour of foreign capital. Taking advantage of the tide of industrial renaissance in India many foreign firms are either inaugurating new concerns, or opening branches or starting agencies to forestall Indian enterprises. Their capital is foreign, their experts are foreigners, they are manned by foreigners and in some cases at least their labour is also foreign. They are, as it were, foreign companies transported wholesale to this country. And the most pathetic issue in this connection

is that their products pass off as *swadeshi* though they will not be able to substantiate their claim save proving their domicile here

PENETRATION OF FOREIGN CAPITAL

To cite some concrete instances, the first and foremost is perhaps the soap industry. Ever since the days of *swadeshi* movement many soap industries—large and small—have been started all over the country, in fact, it is one of the industries which has taken deep root. But the appearance of a powerful foreign soap combine is looked upon with legitimate misgiving. It has been started with an enormous capital and it can therefore muster limitless resources. For some years past biscuit manufacture has been tolerably established but a big foreign concern has opened an agency here and is organising for wide spread distribution. Aluminium utensils, artificial silk, printing ink, etc. are partly subsidised by foreign capital and the goods pass off as Indian. Even such an inoffensive item as khaddar has not escaped their attention. The movement in favour of hand woven clothes was expected to render succour to the needy villagers. But

the despatch of imitation khaddar from Japan and elsewhere has considerably jeopardised spinning and weaving

FOREIGN INDUSTRIES HELPED BY PROTECTIVE TARIFFS

Again the heavy import duties imposed on certain imported articles which being in the nature of protective tariff fostered indigenous industries, have been made to serve foreign interests. A case in point is the starting of several so called match factories with either Japanese experts or partners. Match manufacture has been making considerable headway as a lucrative home industry. But it will now certainly meet with a set back. The Swedish match manufacturers also have formed a trust which is actively engaged in propaganda work and has laid out huge factories in different parts of India. Assemblage and fitting of automobile parts have been undertaken by a foreign company and instances may be multiplied. It will thus be seen that if matters continue in this way there is every chance of not only the nascent industries being nipped in the bud but also of the established industries

being weeded out. The rising industries of India will have to be engaged perforce in a life and death struggle in the infancy of their career and must submit to the universal law of the survival of the fittest.

FOREIGN CAPITAL IN INDIA

Besides far too much of capital, control and management of industries is in the hands of Europeans. According to the Indian Census Report, "European companies own the majority of the tea gardens of Assam and Bengal, but Indian enterprise is growing in regard to private ventures. Indigo in Bihar and Orissa, coffee in Madras, rubber in Travancore are mostly in European hands but the coffee plantation of Mysore are largely owned by Indians. Most of the large collieries of Bengal are held by European companies but 65 out of 73 private concerns belong to Indians. The cotton mill industry of western India is almost Indian while the jute mills of Bengal are in European hands." Control and management in most of the Indian industries is in the hands of Europeans. It is no good to discredit the function of foreign capital and

technical experts from foreign countries but these stand, in many instances, in formidable competition with the scope of Indian manufactures and in such cases indiscriminate importation of funds cannot but be fraught with grave consequences. It is significant that foreign capital in India which has been variously computed as £ 600 millions by Prof Shah and £ 1 000 millions by Mr Birla, entails an annual disbursement of interests to the tune of £ 60 to £ 100 millions.

These are very dismal forebodings no doubt. Nevertheless it is useless to shut our eyes to the conditions we find ourselves in, it would be futile to blink the events that are cropping around us. We must stare the facts in the face howsoever unpalatable they might prove to be. We must do what little lies in our power. We must consolidate our position, we must mobilise our resources and then offer an adamant front to the onrush. We must all unite our efforts to frustrate the intentions of our antagonists who are busy undermining the industrial foundation of India.

INDIA'S INDUSTRIAL BACKWARDNESS

The census figures for 1921 on occupational distribution indicate that the number of people depending on industry and mining is only 10·6 per cent of the total population. While in U S A it is 33·2 per cent, in England 49·6 per cent, in France 31·2 per cent, and in Germany 40·0 per cent. India's figure pales into insignificance. The loss of industrial occupations and lack of capitalistic farming in the country have forced the people to fall back upon the land in greater and greater proportion. While only 64 per cent of the people depended upon the land for the means of their livelihood in 1891, the concentration upon the land now exceeds 73 per cent. Agricultural developments specially when linked to scientific and intensive methods of cultivation, may spell an unqualified prosperity to the country but exclusive dependence upon them is not only undesirable but may be disastrous in its effects especially in such cases where the raw materials are calculated to make the basis of industries and are plentifully available. The Montague Chelmsford Report

did the right thing to point out that "the economics of a country which depends to so great an extent upon the land must be unstable," depending upon the freaks of nature and rainfall. Even the agricultural industries suffer for our industrial backwardness, for the industries are not only the veritable sources of consumption of the raw materials of the country but the rise of an industrial population creates a greater demand for food grains for direct consumption.

IMPORTANCE OF KEY INDUSTRIES.

What is our industrial position? From year to year we import Rs. 250 crores worth of manufactured products, most of which comes in competition with the products of our infant factories and cottage workshops. The import list shows our extreme helplessness. We have to depend for the requisites of daily life upon foreign countries. The list of industries which, though their products are essential alike in peace and war, are lacking in the country is lengthy and almost ominous. We are sadly lacking in certain essential articles such as nails and screws, electric plants, all

kinds of machine tools, steam engines, boilers, oil and gas engines, etc

It has been left for the War to bring out fully the need for advance in the industrial sphere as in the sphere of politics. The War clearly brought home to us the deficiencies of the industrial structure in India. The key industries which grow round production of iron and steel, tools and machineries, heavy chemicals like sulphuric acid are only imperfectly developed. Various materials such as zinc, lead, copper, aluminium, tungsten graphite, heavy chemicals, rubber, flax occur in India and are actually exported but no attempt has as yet been made to work them in the country. The Government of India who are the biggest consumer of manufactured products in India did not care to foster these industries and adopted a *laissez faire* policy. The railways, for instance, in other countries stimulate the major industries and directly or indirectly come to support a host of minor industries by their judicious purchase policy but in India it is otherwise. The requisite materials for the construction and maintenance of

railways, wagons, etc in India are all imported from abroad. Furthermore, in the absence of properly developed key industries, the industrial organisations, as they now stand, are based on unstable foundation. The industries which make use of the agricultural products of the country languish with the deficiency or excess of rainfall. The other industries have a prosperous course so long as no inconvenience is felt in importing the tools, machines and the partly manufactured parts. The Industrial Commission Report drew our notice to this aspect of our industrial drawback. Our industries are built, as if "in the air". The Report says, "Until they are brought into existence on an adequate scale, Indian capitalists will in times of peace be deprived of a number of profitable enterprises whilst in the event of a war, which renders sea transport impossible, India's all important existing industries will be exposed to the risk of stoppage, her consumers to great hardships, and her armed forces to the greatest possible danger." The Commission also recommended that the Indian Government must take special steps to

facilitate the manufacture in India of magnets, incandescent lamps, ferrotungsten, high-speed steel, graphite crucibles, special forms of porcelain for insulation, chemical glass, certain heavy chemicals, rubber and vulcanite

INDUSTRIAL RESEARCH

Our industrial backwardness is no less due to lack of research spirit and taking of patents, and to the failure to secure a healthy equipoise between the production of various industries. In the words of the Industrial Commission "the industrial system is unevenly, in most cases inadequately developed, and the capitalists of the country with a few notable exceptions have till now left to other nations the work and profit of manufacturing her valuable raw materials or have allowed them to remain unutilized." It is time now that India directs her attention to these aspects of the problems which confront her at the present

HOW INDUSTRIES THRIVE

HOW industries thrive, how the dying industries of India can be revived, how new industries can be started, how to stand the tremendous competition with foreign products—are questions that rise uppermost in the mind of every Indian. Enterprise premised, four conditions are absolutely necessary for industrial success—sufficiency of fluid capital, skill, labour and market. Deficiency in any one of these is destructive of industrial prosperity. Enterprise alone can do nothing. The best mental equipment and the greatest skill with plenty of labour are likewise unavailing without capital and demand. Success in industry is dependent upon the combination and co-existence of all these. Now, in India some of these are absent, or are inadequate. Thus is putting in a nut shell the cause of the failure of so many indigenous industries in India since, let us limit the period the inauguration of the Swadeshi movement. We lack capital in the initiation and when

we get it and the skilled labour also, we find that the market is over flowed with cheaper foreign goods. This is how our industries get extinct even before their birth

BAN ON INDIAN GOODS

While we keep our doors wide open for foreign imports, while our market is exploited by foreign manufacturers, our entrance to some of those countries is barred by legislative prohibition. This is an arrangement unfair in the extreme and would not be tolerated in any other civilized country. The circumstance is sorrowful indeed but the pity is that the exporters generally do not know why their business is narrowed after a brisk business for some years

THE VALUE OF PROTECTION

The master key which is likely to unlock industrial renaissance in India is protection. But this was denied her until 1916 against the soundest principles of economics. England who held the destiny of the country in her hand was reluctant to empower India with provisions to impost tariffs against her own manufactures which just began to find market in in-

creasing quantity in the Indian bazaars. Being placed in an advanced economic condition, England took up the brief for Free Trade and was greatly successful in persuading a number of nations to follow her line of thinking and accept Free Trade in principle. The policy was thrust upon India as being to the interest of the dumb consumers of India. No consideration was made for the fact that free trade could not be advantageous for the development of the Indian industries which were hardly in a position to stand in competition with the organized industries of the West. The policy of free trade as pursued in India by the Government up to 1916 has been the cause of the industrial domination of India not only by England but by the European countries generally. And although, as Mr. Ranade once pointed out, the industrial domination of one people by another attracts much less attention than the political domination of a foreign people, this may be described as the most deplorable result of British rule in this country and as the leading cause of the impoverished condition of the Indian masses.

HOW ENGLAND HELPED INDUSTRIES

What England did when her industries were in the infant stage? The history of industrial renaissance in England offers a clear and unambiguous reply. Her people sacrificed their self interest on the altar of the country's welfare. Her great men and the masses combined to protect the infant industries from the fierce competition with Indian products and cheerfully agreed to wear dear coarse goods although cheap and beautiful Indian stuffs were available at hand. England made an all round effort to become self centred and independent of other nations so far as her domestic requirements were concerned—and that was the secret of her rise. The policy England followed in order to develop her own industries, has been very nicely described by List, the German economist —“Had they (English ministers) permitted the free importation into England of cotton and silk goods from the Indies, the manufacture of cotton and silk in England would have been destroyed at once. India had in her favour not only the low price of the raw materials and the cheaper

labour, but also long practice and traditional dexterity and skill Under the system of competition the superiority necessarily was with India, but England was not willing to build up manufacturing establishments in Asia afterwards to fall under their yoke She aspired herself for commercial domination and comprehended that of two countries which deal freely with one another, that which sells the products of her own manufactories, gains and governs, while the other which exports agricultural products, obeys and suffers England therefore prohibited the articles competing with those of her factories, the silk and cotton goods of the East (Anderson 1720) This prohibition was absolute and under penalties She could not consume a thread from India and firmly rejecting those beautiful and cheap products preferred to use the inferior and dearer goods made by her own labourers She sold the cheap goods to the Continental countries, those much prized commodities of the East, she gave them the benefit of the cheapness denied to her own consumers" These measures made England industrially strong

HOW FRANCE ROSE TO EMINENCE

And if we leave the example of England alone, we find that the present industrial and commercial eminence of France serves as a second object-lesson for us. Like India, France was also solely an agricultural country and her yearly deficit in commerce was even in the septennial period of 1885-91 was the huge sum of nearly 35 crores sterling. But the Republic adopted protection in 1892 and her success in achieving the desired result is remarkable. The economists of France now assert that the initial cause of the development of French commerce and industry was the fiscal reform inaugurated in 1892.

THE URGENCY OF PROTECTION

But if we are to follow in the footsteps of England or France, what should we do? The big and small industries are smarting under keen foreign competition. Some of these have already succumbed while the rest are drawing a precarious existence. Not that there is any inherent lack of natural facilities or any deficiency of trained or skilled labour force for their development but they languish

only due to superior foreign competition backed by better experience and earlier start. Protection is of the most urgent necessity to inject vigour into these industries. Protection is the cry all over the world at the present moment. The nations on the Continent and the New World being now equally developed as England, the latter, the father of Free Trade Policy, has been forced to veer round protection and to raise high tariff walls to stop the foreign imports.

SWADESHI—THE SELF IMPOSED PROTECTION

The Montague Chelmsford Reforms armed India with fiscal autonomy. She is now trying protection in a few isolated cases but the measures are characterised by half heartedness and have defeated the purpose which these are meant to serve. The niggardly protection afforded to certain industries has been more than annulled by the artificial manoeuvring of the exchange ratio. Even the President of the Tariff Board has admitted that various factors such as railway transport policy require modification before the protection can be rendered effective. The convention

of fiscal autonomy which had been gathering strength since the passage of the Government of India Act, 1919 has received a rude blow, before it had any opportunity to establish itself. The Government have sought to impose its will in matters relating to the allotment of Imperial preference to the British made textiles against the free will of the Assembly. For obvious reasons we cannot control our legislature and force the hand of the Government to grant adequate protection in each case. The only way left to keep the indigenous industries in operation is to lend them a whole hearted support even at a sacrifice and strictly follow *swadeshi* which is only a form of self imposed protection, pregnant with many sided possibilities in the matter of national development.

THE PROBLEM CONFRONTING BUSINESS

But a heavy responsibility also lies upon the Indian merchants and industrialists. The well directed activities of the industrial and commercial community have spelt in every age and clime unbounded prosperity for the nation. The concentration of their efforts

in marshalling and utilising the economic products of the country to her best interests has resulted in the increase and accumulation of the national wealth and an equitable distribution among all classes of people. This has also led to an exuberance of energy which manifests itself in arts, sciences, inventions and diverse lines. It is no exaggeration when we remark that in India there is a sad lack of a definite and clear-cut programme before the business community, or even if the will to act to a programme is present, the obstacles standing in the way of its realisation are too numerous and difficult to surmount. The inevitable consequence of this has been the miserable economic condition of the major part of the population who are subject to a number of serious ills of life. They are under worked, under fed, stricken with chronic poverty and diseases, and are bereft of all means to improve their lot.

THE AGRICULTURAL INCOME

The poignancy of the situation can best be understood from a consideration of the national dividend or income *per capita* in India

Different authorities have made extensive investigations into the subject but due to the paucity of reliable data for the valuation of the economic products they have arrived at varying conclusions. But in all cases it is found that the total annual production of wealth falls dangerously short of the minimum requirements of the population. According to *Shah and Khambatta* who recently made careful researches in this matter in their *Wealth and Taxable Capacity of India*, the total agricultural income of India arising from the cultivation of food grains, sugar, fruits and vegetables, condiments, spices, oil seeds, fibres, dyes and tans, drugs and narcotics and fodder crops comes to Rs 21,56 crores. The pastoral income from the maintenance of livestock has been estimated to be negligible as the gross receipt from the sale of hides and skins, meat, milk, manure, etc just pays the cost for their upkeep. The income from the fisheries and forests however is calculated at Rs 31 crores. The total agricultural income including those of the pastoral and forest industries thus amounts to Rs 21,87 crores.

but the whole of this is not available to the people for some parts of the seeds must be carried to the next year to be sown for the new crops. The total crop to be carried thus rises to a high figure, about Rs 58 crores. Thus the available income from agricultural and allied pursuits reaches Rs 21,29 crores.

INCOME FROM INDUSTRIAL PURSUITS

The next item which contributes to the wealth of the country is the produce of the industries. But in estimating the income derived from them we must subtract from the total value of production the cost of the raw materials, which as a matter of fact has been taken into account while considering the raw resources of the country. Judging from this point of view the net addition of income by the pursuit of manufacturing industries is Rs 146 crores, of cottage industries Rs 40 crores, of mineral wealth Rs 29 crores, and of building, etc Rs 20 crores, i.e., Rs 235 crores in all.

THE INDIAN NATIONAL DIVIDEND

As there is no other source of wealth in India, the total approximate annual income on

the two items is Rs 23,64 crores, which when divided by 319 millions—the population of India—gives the annual national dividend of about Rs 74, or a little more than Rs 6 per month. It requires no flight of imagination to see that with a capital income of Rs 6 per month none can have even the bare necessities of life, not to speak of the amenities of modern civilization. Yet the whole of this amount is not available to India. Imports into India are of course to be paid out of it but as this is accompanied by an exchange of goods, the national wealth is not impaired thereby. But what we have to pay out of this paltry income is our share of the cost of civil and military administration of the country in the shape of taxes, cesses, import and export duties, etc. Besides these the nation has to send home remittances (Rs 50 crores), pay interest for foreign capital (Rs 60 crores), for shipping services (Rs 42 crores), for banking commissions (Rs 15 crores), and for annual profits made by foreign companies (Rs 53 crores). It may be asked why these payments are made. The reply is not far to seek. We

must pay for the services borrowed from foreign countries, we must pay freight and shipping charges to foreign shippers for the carriage of our goods before they are sold out (we have no ships of our own), we must pay for the services of foreign banks in selling our goods as we have no bank agencies in foreign countries, lastly, many of the big industries which cater to the needs of the people of India are financed and manned by foreign capital and the profit made from them would necessarily accrue to foreigners

THE PROGRAMME FOR THE COUNTRY

The situation in the country is in all conscience serious. It is of the greatest importance that something is done immediately. The burden falls principally on the business community. They should have a well laid programme before them. The masses are ignorant, without capital, and in indifferent health. It devolves upon the businessmen to guide their efforts and give them work to do. They can, for example, arrange the collection and distribution of the raw products which now mostly lie in the hands of big foreign agencies,

they can develop the banking and shipping businesses and retain Rs 60 crores for the starving populace, they can open direct business connections with foreign countries instead of approaching them through English middlemen as in the case of tea and jute which are consigned to London houses to be auctioned there to the other countries of the world, they can start their own agencies in foreign countries to secure the best prices for their goods, they sell or purchase, and save the commission of middlemen to themselves, lastly, they can pay growing attention to the development of industries financed by purely Indian capital which will find increasing occupation for the teeming population. It is of the utmost national importance that the businessmen form themselves into suitable guilds and into influential chambers of commerce to create a strong public opinion in this matter among themselves and make a united effort to carry out this programme which alone can materially uplift the economic status of the people and add to the national prosperity



INDIAN INDUSTRIAL IDEAL.

INDIA is precisely a country of cottage industries upon which, as much as upon agriculture, her teeming millions depend for their livelihood and the support of their families. And therefore the proper improvement of cottage industries is a subject that should engage the earnest attention of the rulers of the country as well as of the landholders and the educated people. It is, indeed, a proved fact that a whole nation, so big as the Indian is, cannot live practically entirely on agriculture—sending their raw products abroad and importing the finished articles for their daily use, for as much as 73 per cent of our population lives on agriculture. It is only proper to develop the industries even if the best interests of agriculture are to be safeguarded but it will be long before she is able to provide men and capital for large mechanical enterprises such as obtain in the West. And even if large capitals can be secured and invested in remunerative enterprises on any large scale,

how far the progress can be expected to be rapid is rather problematic. The success of such undertakings depends in a large measure on the habit, character and training of our industrial classes.

INDUSTRIAL SYSTEM IN ANCIENT INDIA

In ancient India, there was an elaborate system of industrial arts such as weaving, carpentry, masonry, smithy, metal works, etc., and the system was elaborated in the course of centuries when Indian society rested on its old indigenous foundations. The working classes of India are habituated to depend upon their small capital and have never been accustomed to work under large capitalists for bare wages after the manner of European workmen. "Each agriculturist," to quote the learned words of the late Mr R. C. Dutt, "tills his own little field, pays his rent and transmits his holding to his son. The humble weavers working with their wives and children in their homes, live better and more peaceful lives than men and women working in crowded and unwholesome factories. The dignity of man is seen at its best when he works in

his own field or his own cottage—not when he is employed as part of a vast machine which seems to crush out all manhood in the operatives ”

WHY OUR INDUSTRIES DEMAND ENCOURAGEMENT

Of course with the progress of time in industrial labour class is coming into existence, is multiplying in number from year to year and is gradually getting habituated to the mode of living obtaining in the industrial centres, yet the immediate problem is the encouragement of our village industries—our artisans working under their thatches. The products of Indian artisans once commanded the market of the world. Those fine textiles of Bengal and Kashmir, those exquisite stone works of Upper India and Rajputana, those metal works, damascened and encrusted wares, enamelled and lacquered wares and those fine art wares which are the products of simple artisans whose principal “machineries” are their chisel and hammer or some such simple article, still command the enthusiastic admiration of even the advanced western people. And if

attention can be directed to the improvement of their insignificant apparatus, and small machineries can be introduced among the masses of the industrial community—if the common spinning wheel and shuttle be changed for more improved yet simple looms—if the prehistoric drills and crushers can be substituted by more modern and yet inexpensive machinery—we can hope for better improvement of our cottage industries, on which depends so large a percentage of our population. Although some of our agricultural population show some prosperity in some parts of the country in particular seasons, the Indian peasantry as a whole is seen to grow, decade after decade, more and more impoverished, and there seems to be little hope of any improvement if no means are devised to employ them in some handicrafts at least as supplementary occupation. It is therefore imperative that cottage industries should receive the keenest attention of our rulers and people. The introduction of specially improved yet cheap machines suitable for cottage industry will indeed be a move in the proper direction. “Let the landholder’s

association or benevolent individuals offer prizes or any reasonable encouragement for discovery of such a cheap and simple mechanism. Encouragement from the Government and wealthy zaminders in this direction will be a proper move and there is surely enough mechanical inventive genius in India to supply all requirements at a very cheap cost.

THE FACTORY INDUSTRIES UNABLE TO EMPLOY THE ENTIRE INDUSTRIAL POPULATION

Even considering that the habits of the industrial population are undergoing significant changes it must be admitted that the factory hands have not taken kindly to the factory life and the majority of them would down their tools to take up the scythe at the harvest time. Although a purely industrial population has come into being in special areas for special purposes the great majority of those employed are at heart villagers, they have had in most cases a village upbringing, they have village tradition, and they retain some contact with the village. The worker is as a rule, says the Royal Commission on Labour, prepared to abandon the factory if

work offering adequate opportunities becomes available in his native place or if the climate makes serious inroads on his health. Moreover the labourers who can possibly be employed in mills and factories form only an insignificant proportion of the industrial population engaged in indigenous industries carried on in village homes and bazaars. The number of hands employed in the perennial and seasonal factories according to the latest figures compiled by the Labour Commission do not exceed 2 millions only whereas the Indian population is 320 millions. Where hundreds of thousands can work in mills and factories, millions and tens of millions work in their own huts.

THE ADVANTAGES OF MILL INDUSTRY

If mill industries have disadvantages of their own, they have their advantages also. In mills the production is much greater and combination of labour more practicable. The expenditure on production is much less and the finish of the product is nicer and more symmetrical. The strictness of the division of labour in case of the use of mechanical power, the employment of large capital and greater

concentration of labour under expert management in factories certainly bring great possibilities of wealth and material greatness to a country

The interdependence of all branches of industry together with the invention of a multitude of large mechanical devices for increasing production, has effected a complete change in the economic life of mankind in working out a greater national and international trade, abler organization of capital and credit, freer intercourse between the trading nations, greater possibility of rapid increase of capital and more security and extended legal protection for the labouring population. The mill industry has another and more comfortable advantage, according to Western economists, than the cottage industry. In the former the labourers are not robbed of the protection of the law regarding hours of labour, the work of women and children, necessary hygienic precautions, they are free from the dependence on intermediaries or contractors who must necessarily interpose between the artisan working in his home and the consumers. The

labourers, moreover, have not constantly to be exposed to the danger of unemployment and irregular work by the depressed conditions of the market or less consumption of the productions, neither they have to trouble themselves for the adequate sale of the productions

DISADVANTAGES OF MILL INDUSTRY

But mill industry has its disadvantages also—equally weighty as its advantages, if not more. “Among its objectionable portions,” to quote a Western, to boot a French, economist, “are the frequency of accidents, the chronic unemployment and involuntary idleness of large numbers of labourers, over production and the crises it involves, the creation at one end of the social scale of colossal fortunes and at the other end, of a famished labouring class often forced to sell its labour for a crust of bread, while between these two classes there is a special category of property owners, called stock holders, which at first sight it is difficult to distinguish from simple parasites.” At one time it was tentatively believed that the factory is merely a place where work is sought to be done with the help

of machines and the definition did not take into account that the factory does form the environment of human beings as well. It is a significant movement of the times that the growing consciousness among the labour classes and the development of trade unions have served to open their eyes to the rights and amenities of life they can claim as man.

THE DISADVANTAGES OF MILL INDUSTRY.

But the greatest objection to the wanton spread of the mill industry in our country is yet to be told. What effect has been produced on the social condition of the peoples of European countries, by ever-increasing mill industry, should be carefully considered before our people go in for it. Unemployment, in Western countries, of labourers has been considerably increased, clamour for increased wages, possibly resulting in extensive strikes is witnessed everywhere. The condition of the masses—the poor operatives in mills—is becoming more and more degraded while crimes are increasing and wanton drunkenness is ruining many families, causing disaster to the lower social order of the community. And

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the rise of the party of Socialists—whose mottoes are equal sharing, communism, collectivism, co operation—in European countries, specially in the manufacturing districts, may be regarded as the reaction of mill depravities. And with the expansion of mill industry are developing in the mill districts of our own country also the wretchedness, immorality, vices as also strikes, riots, and destruction of property, in fact, the never ending struggles between centralisation of capital and of labour are being transplanted on our tranquil soil where the Indian artisan and handicraftsman working in the midst of his family and honestly toiling for their daily bread, lived once in peace and security, respectably and peacefully.

THE NEED OF HOME INDUSTRIES

By this we do not deprecate mill industry in all forms but we must say that the advantages of widely spreading the cottage industries are more numerous in our country at present than the spread of mill industry. The home industry is a self working, self adjusted and self supporting system, which not only

finds employment for much larger number of the population, but is probably based upon sounder economic principle. Mills may fail or flourish, but a race can hardly be altogether extinct. It can not liquidate, but must always be a valuable asset to the country. The mills and factories are no doubt a powerful adjunct but in India they cannot, and ought not to, form the only or even the principal source of supply.

THE CHANCES OF HOME INDUSTRIES AGAINST ORGANISED INDUSTRIES

In these days of cheap mass production home industries would seem to have no chance of competing with any measure of success with the cheap machine made articles. But those who study the industrial movements of the world would bear testimony to the surprising vitality of the home industries which still go strong even in the industrially advanced countries of the world. Home industries are widely spread in Germany, Japan, France, Italy and other countries and are still an important factor in their industrial life. In England, too, home industries thrive side by side

with the manufacturing industries to this day

Village industries are well established in countries like Germany, Switzerland, Holland and Belgium. Hand labour still persists even in the teeth of the keenest competition. Various articles of our daily necessity are turned out by small employers who keep their workshop alone or with their families or one or two assistants. Their success is greatly due to the use of improved tools and modern methods wherever available. Also it is a significant feature of the modern Western industrialism that the people are rather growing suspicious of the social advantages and benefits accruing from the organisation of huge industries and there is a distinct tendency towards small decentralised plants conducted more or less on the basis of healthy home industries.

POTENTIALITIES OF HOME INDUSTRIES

We have discussed the relative merits and demerits of the manufacturing and cottage industries. But what should be our industrial ideal? There is a school of thought who pin their faith on cottage industries and consider

that in the present political and economic conditions of the country manufacturing enterprises on a big scale by means of elaborate machinery are not likely to succeed

There can be no two opinions about the first point *viz*, cottage industries. The vitality of the old domestic industries in spite of the most stifling competition is most striking. It must however be admitted that they have survived because they are better adapted to their environments and the artisans produce commodities which are in demand and so far have not been displaced by factory made goods. It must not be imagined however that the artisan of to day is wholly uninfluenced by the industrial changes of the past century. His methods remain the same but in some instances he works with superior raw materials and in others with better tools. The weaver has taken to mill yarns and fly shuttle sley, the dyer to synthetic dyes, the brass and copper smith to sheet metal, the blacksmith to iron rolled in convenient sections, the tailor to sewing machines, in each case with advantage to himself from the lessened cost of production

which has greatly strengthened the market. Even the work of paddy pounding, wheat grinding and other laborious home industries are being more and more performed by power driven mills. Viewed from all aspects of view there is no likelihood of cottage industries being extinct but improvement in the condition of the workers is not probable unless better tools and plants are employed and an intelligent subdivision of industrial processes introduced.

VILLAGE HANDICRAFTS AS SECONDARY OCCUPATION

Home industries and specially the village handicrafts demand the best attention of our economists as channels to secondary occupations. During 4 to 5 months' forced retirement among the peasant class much of human energy runs to waste. Home industries may absorb them and augment the wealth of the country. "The destruction of hand industries," remarked the German economist, List, "is a necessary stage through which an industrially backward country must pass before she can take rank with those which use steam and

machinery, and advanced scientific processes and appliances in their industrial productions " And we should not have deplored the destruction of our industrial manufactures, had industries on large scientific methods taken their place But in the present state of our industries when there is general ignorance throughout the country about the industrial conditions of the world, when our available capital is small and confidence in one another in the spirit of co operation for industrial purposes is weak, when there is lack of facility for higher technical instruction in the country and consequently there is a lack of competent business managers who can successfully manage large concerns, our main reliance now—exposed as we are to the competition of the whole world—must be on the proper improvement of our cottage industries Improved implements should replace the primitive tools where possible, careful consideration should be made what old or new industries can be revived or conducted with modern equipments on a large scale and what on the home industries system

CAUSES OF DECAY OF COTTAGE INDUSTRIES

It must be remembered that the death of the cottage industries was not due mainly and solely to tariff wall but to causes which are even now potent in making and unmaking industries. Lack of education, initiative, modern appliances and technical skill are responsible for the gradual deterioration of the products of home labour. It is only by a grasp of the true situation, and by adapting ourselves to new conditions, that we can advance industries in this land. The contributory causes to the growth of industries may be summarised as under — ,

- 1 Discoveries of science, which needs always be utilised in practice

- 2 Application of machinery, which is invented made and used as needs arise

- 3 Utilisation of coal and water or other powers of nature, to reduce the cost of production by reducing the labour bill

- 4 Associated efforts and co operation in buying and selling

- 5 Easy and cheap transport, by land and water

6 Commercial and industrial enterprise to push on sales of the manufactured articles by regular propaganda

7 Division of labour, which helps specialisation

8 Cheap and sufficient capital

9 Favourable and helpful attitude of governments, at home and in international relations

10 Adaptable social and religious systems, to help in the readjustment of new factors

11 Co operation of womenfolk which in the East acts sometimes as a brake on the wheel

12 Competition and avoidance of competition as required by the dictates of prudence and wisdom

13 Combinations

14 Utilisation of by products

15 World markets

16 Literary assistance

17 System of insurance against the risks of fire, water and earthquakes

18 Simultaneous growth in all directions, and

19 Latterly technical education

DEVELOPMENT OF MODERN INDUSTRIES

But the general argument levelled against the bigger industries must be accepted with due reservation. With the higher standard of living the needs of the country are being multiplied. The cottage industries have failed to cope with the rising demand. The consequence has been that the items of imports cover a wide list of articles which can be produced economically in India under expert management with technical knowledge.

It is the growing conviction of the Indians that the penetration of the foreign stuff into the Indian homes even in interior villages has only been possible under an efficient system of mass production which has contributed materially to the unprecedented cheapness of the articles. A study of the economic conditions of the industrially advanced countries also tends to indicate that the application of science to the development of industries lies at the root of their material prosperity. Invention of labour saving appliances and machineries for

the simplification of processes of manufacture leading to an increase of output has laid a solid foundation of their industrial structure. Diligent application and research for arriving at improved processes of manufacture permitting the utilisation of the bye products and elimination of waste have strengthened it while the happy assemblage of raw materials, labour and experts and economic purchase and distribution which are only possible under a system of large scale production, have gone to their final success.

Considering the remarkable changes in the outlook of life and the standard of living and taking into account that India has been drawn into the vortex of international trade movements, production on a large scale is to be encouraged at least in certain special branches of industries, if these are to stand in competition with the foreign industries. The consummate success met by the ceramic, pencil, match, glass, paper, paints, iron and steel, engineering, hosiery, biscuit, chemical and other industries would also point to the same conclusion.

THE CONCLUSION

The industrial ideal should thus consist in helping the growth of cottage industries utilising improved tools and machines where necessary to increase production and earning capacity. But no less important are the industries requiring technical skill and mechanical knowledge. And men to conduct them should not be wanting. Our educated men in search of suitable career can acquire technical training and can run small factories with the help of the old school artisans on a mediocre scale. They should not content themselves with the roll of *mahajan* or *bepary* (middlemen) occupations. They should reinstate the decaying industries with the infusion of new blood and adapt modern improved methods and processes of production and distribution, and keep themselves in touch with the industrial progress of the world. They should not remain divorced from the practical prosecution of the industry and be so many parasites on the *mistry* and labour class. Each of them should be in a position to take off his coat and capable of doing any job on the floor.

of the workshops done by the workmen—a psychological and practical difference to the usual conditions prevailing in cottage industries now. It is gratifying to learn that within recent years men belonging to socially advanced classes are taking increasing share in industry. They are bringing to bear their capital resources, technical knowledge and ideas. But if they really desire a revival of the industries they should take upon themselves the responsibility of bringing home the defects of the primitive methods and demonstrate how these can be remedied by the employment of modern tools and labour saving appliances. The Government have also the onerous duty of imparting technical education freely. These will go a long way in laying the solid foundation of an industrial India.

INDUSTRIAL FINANCE

THERE can be no question that industrial expansion is being retarded in India chiefly by the scarcity of long term credit for industry on low rates of interest. Agricultural credit in this country suffers more or less from the same drawback, but there is at least the organization of co operative finance to meet some of the business needs of the peasantry. Commerce as well as trade suffer little in this respect because capital can usually be obtained on short term credit, though often on high interest, from the joint stock banks and private financiers in India. Securities are, however, taken almost invariably by banks and money lenders. But the kind of capital that is very scarce in the country at present is industrial finance.

Joint-stock banks usually refuse to advance money for lengthy periods on the security of factories and workshops, especially if they are new ventures, since they cannot exer-

cise any supervision over their working. Small loans for short periods are, however, given to well established concerns with recognised credit. Their *hundis* drawn at 30, 45 and 60 days' sight circulate fairly freely in the money market. But industry cannot expand until capital is forthcoming for fresh enterprise. A few years ago some attempts were made but most of them did not succeed for various reasons, among which the principal ones seem to be that they endeavoured to finance long term deposits, that they sank too great a proportion of their funds in particular lines and made other departures from the accepted system of industrial finance, also because the borrowing companies were hastily floated in the deceptive boom of 1919-20 which was soon to pass away.

DIFFICULTIES OF SMALL INDUSTRIES

These were exceptionally unfortunate circumstances for an attempt to introduce a new system of finance in India when even ordinary joint stock banking had recently suffered by the failures of the Indian Specie Bank, the People's Bank of India and the

Alliance Bank of Simla A combination of such circumstances is enough to shake the confidence of depositors in a bank and of the investing public in new ventures. Naturally in the case of small industries or of concerns that are new to India capital is difficult to procure even from friends and well wishers who do not fail to remember the few instances in which business integrity and efficiency have been violated. In a rich country with a high level of industrial ability, investors are able to risk more capital and indeed they can have greater trust. Such would be the case, for instance in the United States, the United Kingdom, Germany and Japan, but in India it can hardly be better than what it is at present.

THE QUESTION OF SECURITY

Capital for small industries can, however, be obtained against securities such as the industrialists can seldom procure or at so high an interest that their profits are swallowed up. The above picture portrays merely the initial financial strain, which if overcome, the path would be made less rough for industrial pro-

gress To provide for this insistent need, it was proposed a few years ago, after the merging of the Tata Industrial Bank with the Central Bank of India, to establish a State Industrial Bank with a large capital and numerous branches to afford financial support to industries for longer periods or on less restricted security than is within the power or practice of existing banks An institution of this type with a measure of Government support and control was suggested and discussed throughout India but nothing resulted from all that clamorous vociferation owing to the general ineptitude for economic development The project of the Reserve Bank of India as the Bankers' Bank for long held the air but this has also been now abandoned

CHARACTERISTICS OF GERMAN INDUSTRIAL BANKS

Since banks of this kind have played some part in the industrial development of Germany and Japan, it would be instructive to see how they are organised "The characteristics of the great German industrial banks," describes a reliable report, "are briefly the high proportions 1 1 5

tion of their paid up capital to their total cash transactions, the readiness with which they finance industrial and commercial business and participate in fresh industrial ventures by taking up and eventually selling blocks of shares in such undertakings, and finally the large extent to which they retain a control of the industries and businesses which they finance by appointing their representatives as directors. They have thus been able to make such undertakings help one another and therefore the bank, and have at their disposal the wide range of technical knowledge and experience of these assisted businesses to aid them in deciding on the merits of further undertakings. It is alleged that behind these banks stand the Reichs Bank and the German Government.

THE CHARACTERISTICS OF JAPANESE BANKS

German industrial banks, supported by the State, seem to be specially designed to meet industrial requirements in Germany and should serve as models for similar institutions in India if they are adapted to suit Indian conditions. But it is apparent that, without State

support, such banks cannot be started at present in India. Even industrial banks in Japan are supported by State during the stage of infancy and they seem to be of a type similar to those in Germany. "We may consider as a specimen of these," states an official report, "the case of the Nippon Kogyo Ginko, a Japanese industrial bank with a Government guarantee of limited duration. The bye laws of this bank, which require Government sanction, forbid the loan of an amount exceeding half of the bank's paid up capital on urban land or industrial buildings, its debentures may not exceed the value of certain securities held by it or be more than ten times the paid up capital, and the bank must not give loans for longer periods than five years. We find thus in Japan a considerable degree of State support and control in the case of banks which are designed to assist the commerce and industry of the country."

THE NEED FOR LONG TERM CREDIT

Since the most useful function of industrial finance lies in the granting of long term credit, and the best security availed for this

purpose namely, the immovable property of factories and workshops or their equivalent in the shares of new flotations would not be accepted in the money market, the only other security must be the credit of the Government. In consequence State guarantee becomes indispensable if industrial banks are to be started in India. In agricultural finance, there is a way out of the difficulty by offering the security of holdings through land mortgage banks, but in industrial finance no such alternative is possible. So far the financial organisation of India is woefully deficient because she has no mechanism for long term credit either to agriculture or to manufacture.

STATE AID TO INDUSTRIES IN INDIA

There has been a tardy recognition of the duties of the State towards industries in India. The responsibility of heightening the prospects of success by offering state aid to small industries, conducted by indigenous endeavour, is still left very much in the background. Now that the bulk of the lower middle classes in India are virtually on their last legs economically, it has dawned on some of their represen-

tatives in the Legislative Councils that some sort of stimulus should be provided to help them to expand the small industries of the country. In accord with this scheme the Provincial Legislative Councils of Madras, Bihar and Orissa, the Punjab, the United Province and Bengal have already adopted some legislation. The system introduced by these Acts aim to afford state aid in the form of loans, cash credits, overdrafts, guarantee, purchase of shares and debentures, etc but the mechanism is often so cumbrous and the conditions of help so many and rigorous that the Acts bring in very little actual relief

THE REVIVAL OF INDIAN ART INDUSTRIES

THE unique appreciation with which the Indian artwares displayed in the last Wembley Exhibition held in London were greeted by wide public and the connoisseur of art once again brings to the forefront the question of revival and popularisation of the Indian art industries

CAUSE OF DECAY OF ART INDUSTRIES

It must be generally observed by all that the art wares now exposed for sale by dealers are degenerating from year to year and more so during these last few years. This is, however, not due to expert artists being extinct in India. On the contrary, expert artists still exist and work on a small scale, knowing not how to dispose of their wares. To that indefatigable worker, Mr T N Mukherjee, is due the honour of bringing real works of Indian art to the notice of the Europeans. It was to his skill, perseverance and ingenuity that the Indian works of art were put on for sale

in the various railway book stalls of India. The decline of the art industries is attributable to the vitiated taste of the Indian society, the want of knowledge of a large number of tourists as to real Indian art, and to a very great extent to the guidance of the artisans by Anglo Indian and Indian dealers of the present day. Again "the favoured few" in India that have the means to furnish artistically are devoid of any taste for harmony of colours, shape and form. They are only too apt to copy the worst of European designs, shapes and forms. The rich Indians have more often than not lost all appreciations for what is really meritorious in Indian art and have mostly fallen easy victims to cheap fashions. Tourists have little time to select also, and a few have a knowledge of Indian shapes and forms, and they buy anything that appeals to them to be Indian, and in most cases by such as are cheap. The Anglo Indian has generally not the means to pay what a well made article costs. Their purchases consist mostly of what they have to send home as presents and calculating on

the slight knowledge of real Indian art of the persons for whom they intend them, as well as suiting their means, mostly buy the cheapest. Consequently the artisans make the class of wares that they know they can sell. In addition to the above, competition in trade is also an important factor that less and less artistic wares are from year to year made since the dealers in art wares, for reasons of profits, order such from year to year to be made cheaper and also consequently more inferior.

HOW CONSERVATISM HELPS ART INDUSTRIES

It is to the caste system, the conservatism of Indian society and their love for tradition that art industries in India have not by this time entirely disappeared. It is still the pride of every father, and the tie of caste demands it, that sons are taught the trade of the father, although they might, when they grow up take to other trades for want of work in their own. This and the conservatism of Hindu society and love for pomp and show have maintained the art industry, as it is, up to date. It is in the Hindu household, temples, religious and social processions, that indige-

nous art industrial articles are in demand, not that it is understood or appreciated, but merely as custom demands. It is, thanks to this that there are artists in large numbers, but there are still good ones who are artists in the real sense of the meaning. They can still make as good and artistic wares as ever was made if they only could find a market for their wares. But what they stand in need of is advice as regards what to make.

FACILITIES FOR TRAINING

A considerably large number of art schools accessible to artisans all over the country will be greatly helpful. Travelling teachers visiting villages and smaller cities, teaching artisans in modern technics in their arts also supplying them with models, shapes and specimen articles after which their wares should be made will enliven the Indian art with wholesome variety. Another thing they require is financial assistance as well as a medium to find markets for their wares. It is high time that the industrial banks, co operative credit societies and such concerns should come forward to assist the artisans in pecu-

mary matters and the leaders should try to establish industrial museums and information bureaus all over the country for the disposal of art industrial wares

POSSIBLE INDUSTRIES

The industries of which a large number of artisans are still in existence and that have every chance of being revived with success are —

Fancy silk, cotton and wool weaving, metal works, wood and stone carving, carpet weaving, and other art industries that were once famous in India of which now a less number of artisans are left, but that are of merit and for which raw material is present in India, and which can be successfully revived with every chance of a financial success, and that would employ a large number of hands are embroidery, hosiery, enamelling on metal, lac and lacquered works, horn, bone and ivory industries, fibre, jute, sugar, and indigo industries, hand printing on cotton and silk tanning dyeing, and the fine art industries. The above named art industries would appear to the uninitiated but a small number to be consi-

dered of any great national importance. This, however, is not so. The art industries we have named include an immense range of lines providing almost everything of commodities that one wishes to have made artistically for personal use, dressing, furnishing, architecture, and other requirements in life. If India has been called the "Epitome of the world," why, surely then we must have in it what we require for our own lives. Her fauna and flora, her hidden and exposed mineral wealth, her jungles, her waters, her mountains and hills, her soil, everything upon which we live can give us anything if we try for it. There is hope still as we see from the various activities going on for the past few decades.

FINDING MARKET FOR ARTWARES

We shall be amply justified in launching upon a thorough scheme for the sale of Indian artwares. The plea of cheap imitation and foreign competition need not deter us for the simple reason that machine made goods can never attain the artistic merits of hand-made articles. Particularly, the Indian artwares with a hoary tradition and culture be

hind them and imbued often with quaint mysticism and sometimes with religious sentiment will always appeal to aesthetic tastes and capture romantic imagination. The shawls of Kashmir, the brasswares of Moradabad, the silk brocades of Benares, the ivory work of Murshidabad, the muslin of Dacca, the calico of Masulipatam, the wood carving of Mysore, the lacquerware of Burma—all these and others will hold their own against any odds. From early times they have found their way to every corner of the globe and have been received with as equal satisfaction by the fastidious millionaires in the Land of Dollars to day as by the august Caesars in the hey day of glory of the Roman Empire. But if there have been intermediate lapses of foreign patronage it is solely because of our fault for we have neglected our own industries and have ourselves relegated the *swadeshi* goods to an inferior position.

MUSEUMS

In order to find a permanent market for Indian artwares we have perforce to organise our resources on a large scale

First of all museums must be opened in every provincial capital to house typical samples of local produce and a central museum either at Delhi or at Calcutta with a representative collection of all Indian artwares. A dozen such emporiums will ensure the adequacy of the supply of Indian artwares and will be of immense practical help to those who wish to trade in them.

INTERNAL AGENCIES

Internally, agencies must be started in this country with wide ramifications to collect the country made artwares from the industrial centres and even remote villages. The need for standardisation must not be overlooked in this connection. The uniform standards as to size, shape, colour, finish, etc., must be strictly adhered to. Of course the patterns would change with fashion and adaptations are necessary to suit divergent tastes. But in every novel departure care must be taken not to sacrifice distinctive traits to expediency. The question of cataloguing these products comes next. They should not only be judiciously classified but should also be assorted according

to quality and price. The catalogue should be as comprehensive as possible with illustrations and description of the products offered for sale. Much depends, in these days and in foreign countries, on well got up trade literature which may be both attractive and educative so as to draw interest in Indian artwares.

FOREIGN AGENCIES

Externally, there are certain alternatives. Stores of Indian artwares may be opened in foreign capitals by Indians themselves. Or Indian firms dealing in these artwares in this country may delegate their agencies to foreign companies. This latter course would be more expeditious though the former would be more desirable. The best course would be to assist materially the foreign firms in creating a demand for and in the disposal of Indian goods in their respective countries, for they will more readily win the confidence of their countrymen.

The prospects of Indian artwares obtaining a wide sales market in foreign countries are not at all incapable of realisation. Earnest

endeavours must be made to build up a steady market for them in the cosmopolitan cities like London, New York, Paris, Berlin, etc. Honest efforts must be made to create a demand for them in the hearts of the people of Europe and America

THE POSSIBILITIES

Such elaborate organisations, if soundly co-ordinated, will open up immense possibilities. The indigenous industries which have died out will be revived. Those which are in a moribund state will be rejuvenated. The economic condition of the cottage workers will be considerably improved. The villages will be blessed with peace and prosperity. Many enterprising youngmen will have a number of occupation thrown open to them. In short this will create a channel for the influx of foreign money into India thereby increasing our national wealth. But even apart from these considerations we must strive to achieve ultimate recognition for Indian artwares as valuable commodities of international commerce

METAL WARES OF INDIA.

METAL wares of India form no new industry, and perhaps are the most important art wares of India, really indigenous and ancient in fashion and style. Metal utensils have an extensive use in Indian households, both Hindu and Mahomedan, as much as the glass and porcelain wares are used in modern European countries. But as to the finish and fashion of metallic art wares of India their beauty of workmanship and tension of temper, India occupied the foremost position in the world's market. We have mentioned the Indian steel as being highly valued in the steel ware manufacturing centres of Persia. There is evidence that metallurgy was known to the Hindus from very earliest time of which no records can now be had. That the best Persian swords were made with the Indian steel shows that the art of smelting iron and forging steel was carried by the Hindus to a high degree of perfection. Of other metal wares lead and tin wares, gold and silver plates, sword and

sword-belts, copper and brasswares damascened and encrusted wares, enamelled and lacquered wares, as executed in pre-British India, and in India of to-day are highly valued and admired, for the excellent workmanship and beauty they exhibit of the indigenous arts of the country.

THE INDIAN TYPES OF METALWARES.

This art industry covers a very wide range. It includes among others the following chief one; iron, lead and tin wares; tinned, painted and lac-coloured wares; enamelled and niello wares; gold and silver wares; damascened and encrusted wares; and copper and brasswares. We have from the authority of a great writer, "The antiquity and excellence of the Indian knowledge in iron may be judged of from the famous iron pillar at the Kutub near Delhi, from the numerous examples of wrought iron, also hammered and perforated brass gates at the forts and tombs of India, and from the superb collections of ancient arms to be found in the armouries of India," and the sword blades of Herat, Meshed and Shiraj which were highly esteemed every-

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where were all made from steel imported from India.

THE CAUSE OF DETERIORATION OF THE INDUSTRY.

But the time has changed. The artists in India are still exceptionally clever in the preparation of chased, engraved and encrusted wares in gold, silver, brass, copper and pewter. If the artisans had had a little more assistance by private enterprise, these art works ought not only not to have deteriorated but with modern technic that can be applied, it would have vastly improved. But as the artisans were left to themselves, they continued to make their wares in objects such as arms which one wears, *hookas* which no one uses since cigarette holders are in fashion, *lotas* which have been displaced by glasses, oil lamps which have been replaced by a superior electric light, gas or kerosene lamps, and so innumerable other now useless articles to the modern Indian, and of no value as any thing else to the European collector but a curio. The encrusted wares which were made for decoration and embellishment of arms could be success-

fully applied to door and window furniture; silver, brass, copper wares could be wrought into innumerable objects of use that would be eagerly sought for not only by ourselves, but by world's market. And few countries could compete with the Indian artisans in these lines.

ART CURIOS OF STEEL

Of the metallic wares made in India damascened and encrusted wares may be classed as indigenous art wares of high perfection. The engraving and carving of iron and steel was some years ago an important industry in India. Kanara, Madura, Malabar, Vizagapatam and Mysore were famous for this work. Throughout India the dealers in art curiosities offer for sale swords, daggers, shields, helmets in carved steel, of Indian manufacture, and in a few localities the art is still pursued, such as in Jodhpur, Udaipur, Jaipur, etc. If these wares can be carried to the markets of the world, a new avenue for a lucrative Indian trade can be opened out to the immense benefit of the poor artisans of this country.

TINNED AND LACQUER WARE

There is an old art in tinned and lac-coloured wares of our country which assumes considerable importance in several centres of which the most noted are Kashmir, Peshawar, Moradabad, Bairelly and Jaipur. Tinned metal is largely turned out in Kashmir and various towns in the north Punjab. "The art," says Sir George Watt, "seems to have come from Persia." The designs in several towns varies from each other. Tinned shield, lamp stand, trays, bowls, *Kuzas* (water pots) etc., are some of the tinned and painted articles of metal which are highly appreciated even by Europeans. Of the lac-coloured metal-ware industry the original, and to this day its chief, centre may be said to be Moradabad. The system of ornamentation appears to have been designed to imitate the class of encrusted ware, known as *Bidri*. Of other patterns of lac coloured wares may be mentioned *Merori* and *Charakwan* forms, on which, as a result of recent developments, coloured flowers and even mythological subjects are inserted within the original patterns.

THE MANIPULATION

How the whole process is manipulated is an interesting study. We quote from Sir George Watt's description — "The process of manipulation is the same in all namely, the design is chased on the metal, the excavations thus made are then loaded with black or variously coloured lac applied by a hot bolt, which fuses and distributes the lac over the surface. The excess smeared beyond the designs is removed by sand or brick dust and water, by sand paper or by means of a file. The surface is next polished and the patterns thus appear in colours within the metallic surface. Should the vessel have been gilded, silvered or tinned the coloured ornamentations are shown on a gold or silver or tinned background." The modern tendency, however, has been to discontinue the elaborate process of producing a coloured background and to substitute a coloured design on a metallic surface.

ENAMELLING ON METALLIC WARES

Enamelling on metallic wares is another indigenous process which won for the metal

art of India a wide reputation. It may be described as the art of colouring and ornamenting the surface of metal by fusing over it various mineral substances. In spite of the limited resources of jewellers in India, the furnace being very small and the method of heating defective, the results are often "extremely beautiful," and success, in this branch as well as in any other branch, depends on the skill and resources of the operator and the materials employed. The subject of art enamelling is treated in a separate chapter.

Enamelling on metal though not of considerable importance is of great artistic merit and is fast dying out. It deserves to be revived.

STONE-CARVING IN INDIA.

STONE CARVING including stone building and inlaying work attained a high degree of perfection in our country, in pre-British days. The famous stone masonry of Northern India in Hindu temples and Moslem mosques, has earned a wide-world reputation for fineness of workmanship and tastefulness of design, which has not been equalled in any other part of the world even in these halcyon days of engineering marvel. This important indigenous industry of India can be revived and carried to commercial importance yet. Sandstone industry of Mirzapur, Agra, Gwalior, Bharatpur, etc., the marble industry of Jaipur, Jodhpur, Jubbalpur, etc., the lapidary work of Bhera, Delhi, Jodhpur, Banda, etc., inlaid work of Agra, Bharatpur, Mysore, etc. are looked upon with admiration wherever possible.

THE HINDU STYLE

The history of the development of stone industry in India makes an interesting reading

although the bigger works, masonry-buildings etc , have little commercial value in these days The excavation of cave temples and construction of topes may be said to be the first stage of the real development of stone work in India The building of temples during Hindu, Chalukyan, Buddhist and Jain periods, the carving of statuettes of Gods and Goddesses, show to what extent the perfection of stonework attained before the invasion of Mahomedan arts The Indian art of stone carving was gradually evolved and matured from aboriginal thoughts to the Hindu, Jain and Buddhistic, and back again to the modern Hindu, forms until from a foreign source there came by far the most disturbing elements of all, the invasion and conquest of India by various Mahomedan races

THE MOGHUL STYLE

Under the Moghul Emperors of Delhi the workmanship and art of stone work attained its climax with the building of mosques, tombs, palaces, etc "The Emperor Akbar," to quote the descriptions of Sir George Watt, "having seen the political danger of exclusive

reliance on foreign modes of thought, when dealing with a conquered country, pioneered a new departure, namely the liberal adoption of what was beautiful and commendable in the indigenous arts of India. He introduced the system of encrusting marble with other coloured stones, in place of coloured tiles of his Pathan and Persian predecessors. He authorised a liberal use of life portraiture in both animal and vegetable forms. In other words, Hindu treatment of Mahomedan subjects became the rule, not the exception."

INDO SARACENIC STYLE

Shah Jehan, who ascended the throne in 1627, very shortly turned his attention to architectural and decorative arts and in consequence so much improved upon style of his father and grandfather that a new style in stone work was originated that has more specially revived the name of Indo Saracenic style.

In consequence of the devoted encouragement of the great Emperor architect a long list of beautiful buildings came into existence which became a dazzling picture in photogra-

phic detail, precipitated on the very border-land of dignity and propriety. Among them the following may be specially mentioned — the Khas Mahal of Agra (completed in 1637), the Jumma Musjid of Agra (in 1644), the Taj Mahal of Agra (in 1649), the Moti Musjid of Agra (in 1653) and the Jumma Musjid of Delhi (in 1658).

It will thus be seen that from the time of Akbar forward the blending of the original Hindu style (which was developed during the Buddhistic and later Hindu periods) and the Mahomedan style as imported by the Pathans and Persians, became the fashion and Hindu artificers were utilised much more freely by the Mahomedans and were given a comparatively free hand to follow their own conception in the ornamentations of buildings required of them. And in course of time the Hindu artificers became experts not only in fulfilling the wants in the Mahomedan arts but imbibed what was the good and commendable in the arts of their masters. The results of this harmonious blending necessarily were that there has scarcely been a temple in Northern India

which is not Saracenic in style and feeling as was originated in Shah Jehan's time

And during the lapse of the past three or four centuries all this has been changed in a perfectly surprising manner "In travelling from one end of India to the other," to quote from an authority on the subject, "in the study of crafts and industries, one circumstance is brought home to the observer more forcibly than almost any other, namely, that while a very large percentage of the skilled labour is Mahomedan, the industries are financed and controlled by Hindus"

THE CHIEF CENTRES OF INDUSTRY

The development of stone industry in India in view of its commercial possibilities is an important consideration that should engage the earnest attention of our trades people. The important centres of minor stone works are mainly the hillside districts of both Northern and Southern India. In Rajputana, Udaipur, Jodhpur, Jaipur, Alwar, Ajmer, Jasalmer are famous for modern work in marble and sandstone. In the Punjab Delhi is at present the centre of modern and decent work.

although there are some other minor places; whereas the chief traffic in turquoise is from Kashmir where within the past few years a real industry has arisen in the production of picture frames and other small objects in metals with a surface layer of fragments of false turquoise compacted by a cement. In the United Provinces the best known locality for marble work is Jubbalpur whereas stone work of Agra, Muttra, Mainpuri in both sandstone and marble is of no mean reputation. In Central India, Bharatpur, Dholpur, Gwalior are among the chief places where work and business in sandstone are carried on somewhat extensively. In the Central Provinces, Chanda and Bhandara are the two districts which attained a fairly high reputation for their stone work. In Bengal, where the art of stone carving is practically unknown and where there is very little stone of any kind, some work is met within tracts traversed by hills such as Chota Nagpur and Orissa and in some districts such as Manbhum, Shahbad, Gaya, Monghyr, etc. In Southern India in the Madras Presidency there are some an-

cient temples and buildings in stone which are exquisite for their beauty and workmanship but of the several centres of modern stone work very few compare favourably even with the work of several centuries back But in the Bombay Presidency modern work in good sandstone, rough marble and various forms of limestone are met with in several places, the best known carvers and masons being in Rewa Kantha, Ahmedabad and Kathiawar

MARBLE IN INDIA

India has long been famous for its marbles, chiefly on account of fine buildings such as the Taj Mahal, built from this material by the Moghuls Amongst the remains recently found on the ancient site of Mohen jo daro in the Larkana District of Sind were shaped and dressed blocks of polished marble, many of them evidently for building purposes The stone resembles that from Mekrana in Rajputana, whence we may imagine it to have been carried across the desert to the ancient city Associated with these shaped blocks were found seals bearing a script having many resemblances to the Sumerian Script of Meso-

potamia The marble quarries of north western India, therefore, appear to have an antiquity which it would be difficult to rival The best known occurrences of white marble are at Mekrana in Jodhpur, Kharwa in Ajmer, Maundla in Jaipur, Dadikur in Alwar, and Tonkra in Kishangarh, the last named being dolomitic marble It is to the coarseness of their grain that these marbles owe in part their resistance to the weather, it is their purity that enables them to maintain their white surface, and it is their translucence that gives them their delicate softness, which could never be obtained from a fine grained marble more suitable for statuary than for architectural purposes Similar white marble occurs in unlimited quantities forming the hills of Kyaukse, Sagyin and Mandalay on the banks of the Irrawadi A coarse white marble is found in Mergui, whilst a saccharoidal dolomitic marble is exposed in large quantities at the far famed Marble Rocks, forming a beautiful gorge traversed by the Narbada River near Jubbulpore Marble has in the past been quarried in the Betul district of the Central Provinces

OCCURRENCES OF COLOURED MARBLES.

Homogeneous yellow marble and also yellow and grey shell marble are found at Jaisalmer in Rajputana. Serpentinous lime stones, showing green and yellow tints are found in Ajmer and other places along the Aravalli belt; but the most striking example of this class occurs at Motipura in the Baroda State in the form of a handsome mottled green marble; a beautiful marble is obtained also at Sandara. A black marble taking a good polish and other varieties are found in Rewa Kantha, Rajpipla. Near the Nerbada River in the Indore State a fine coralline lime stone, capable of a high polish is quarried, and used in the construction of temples and places. Very variegated serpentinous lime stones occur also in parts of the Cuddapah and Karnul formations in the Madras Presidency, and at several localities in the Nagpur and Chhindwara districts in the Central Provinces. Marble is plentiful in the Idar State. Pink marbles occur in abundance in the Aravalli belt of Rajputana, and in the Narsinghpur district of the Central Provinces. Mottled and streaked grey marbles occur in

Jodhpur, dark grey marbles are obtainable in Kishangarh and Jodhpur, while black marble has been found at Bhainslana in Jaipur. A mottled concretionary dolomitic marble occurs in the Vindhyan series in the Gwalior State, whilst only marbles are found at Nurpur in the Shahpur district, and near Jhuli in the Baluchistan desert.

Extensive tests made on Mekrana marble have shown that it is superior in many respects to the foreign marbles imported from Greece and Italy, and it was therefore decided to employ it in the construction of the Victoria Memorial in Calcutta, writes the Quinquennial Report on the Geological Survey in India.

Marble is also quarried at the State Marble Works about 8 miles from Narnaul Railway Station, Patiala State where an experimental marble plant has been installed. There is also a small annual output of marble in the Mandalay district for images and pillars but no figures of production are available.

THE QUESTION OF FREIGHT

In spite, however, of the existence of such large supplies of marbles of every variety in

different parts of the Indian Empire, there is a large import of marble from abroad, chiefly from Italy and Greece. This is due partly to the great distances that separate the Indian marble deposits from such cities as Calcutta and Bombay, and partly to the systematic organisation of quarrying operations in Europe by which the cost of foreign marble has been reduced.

On account of the freight advantages attaching to the supply of European marbles, it would probably not pay to lay out much capital on Indian marble quarries, but with an order sufficiently large to warrant systematic quarrying operations, marble ought to be procurable at a cost that would repay its employment locally in Rajputana and possibly in Burma. The Rajputana quarries are both protected and hampered by their distance from the sea board, but in Burma there are hills of marble standing on the banks of the Irrawadi and therefore well suited for water transport.

COMMERCIAL POSSIBILITIES

Having thus surveyed the whole field of stone work in India we should now turn to

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its commercial aspect What are the minor works that are prepared from the various stones—is an interesting study Such work as wall brackets, vases, candlesticks, stone parapet, marble statuary of common animals, such as elephants, cows, horses, etc., idols, etc., in white, red or black marble, are very much appreciated and admired by all people, foreign and Indian Models of Hindu temples, Moslem mosques and tombs, Buddhist pagodas, forest scenes carved in stones, carved marble lions are sold extensively among our country men and foreigners Cups, bowls, paper weights, small tables in pudding stone and lime stone can be extensively sold even among the common people

LAPIDARY WORK

Lapidary work is another branch of stone work which also developed in this country in a marked degree The jade stone and stone work of purbeck marble inlaid with mother of pearl and stones, as worked up at Bhera in the Punjab is a real work of art which can captivate any mind of an aesthetic turn Chess boards, trays, tea sets, book

rests, travellers' jugs are some of the commonest articles in these stones, which rich people all over the world will feel proud to possess. Cups, *hukka* bowls, casket, sword and dagger handles and such like articles made of Indian false jade, and richly jewelled, will not fail to captivate the monted minds of Europe and America provided these articles are carried to the market of those countries, thereby opening out a new avenue of income to our stone workers.

The lapidary workers of India have been known from the remotest antiquity. "The agate vases of Broach and Cambay," to quote from the account of Sir George Birdwood, "have been famous under the name of Murrhine vases from the time of Pliny. It is probable that the polished and cut pebbles which the tourist and visitor is induced to buy at many well known sea side and other resorts in Europe, as mementos of the place, have not only been originally produced but have been cut and polished in India. If it be so the trade is a more creditable one than that which sends sham jewels to Ceylon, because the stones are

really what they pretended to be true pebbles, and they are often extremely beautiful objects ”

We need not say much on this subject. Its importance in architecture and furniture needs no explanation. Indian buildings and furniture ought to be embellished with carvings that would be the envy of the world as it was in ancient times

WOOD CARVING.

LIKE stone carving and metal work, upon which we already dwelt, wood carving has also a pre historic reputation in India. The high accomplishment and the historic importance which the carpenter's craft attained in India is glaringly manifest throughout the country in temples and ancient palaces where splendid constructive and decorative designs still, after so many centuries, captivate many admiring eyes. Even now the remnants of the carpenter's crafts handed down from sire to son from generations, still existent in the country are met with in architecture, furniture and cabinet work where wood is ornamented and decorated in numbers of ways such as by carving, inlaying, veneering, painting etc. Although for the last few decades good wood for decorative work is becoming dearer and scarcer too, India abounded, and still abounds in first class wood of uniform and straight fibre and having as little knots as possible. For ornamental work

our workmen generally employ *teak*, *shishu*, *deodar*, sandal wood, ebony, *taon*, *num*, *dudhi*, *sal*, *babul*, *cedar*, etc And all these woods are available practically throughout the country

WOOD CARVING IN THE PUNJAB

In India ornamental wood work is carried nearly all over the country from the Punjab to Burma In the Punjab the principal centres are Hoshiarpur, Jalandhar, Ludhiana, Amritsar, Bhera etc, where *deodar* and *shishu* are the chief woods employed in executing decorative works in low relief and curious animal forms and mythological representations In modern time however, the artisans are taking recourse to other woods, specially walnut, in working very elaborate *Pinjra* work and other articles of every day use such as small tables, picture frames, brackets, etc

WOOD CARVING IN U P

In the United Provinces the chief centres of wood work are Aligarh, Bareilly, Muttra, Bijnor, Mainpuri, Ghazipur, etc, where the timbers mostly employed are *shishu*, *sal*, *num*, *dudhi* and ebony The massive doors

and rich window frames which are seen in every old temple are manifestation of ancient works that the U P carpenters were doing in wood for generations past. Of the other works in wood that we still find in the U P are the carved caskets, plates, trays picture frames and the like done in soft white wood *dudhi*. In Farrukhabad, which has the reputation of producing some of the finest wood carving in the province, fret work panels and rich floral carved screens are the chief wood works. Ebony carving has attained a graceful style in Bijnor and in cabinet maker's art this has attained high proficiency. Of the articles of every day use tables, chairs, caskets, picture frames, walking sticks and such other articles are turned out richly engraved in this district. Toy manufacturing is another branch of wood industry that is very largely pursued in the eastern part of the United Provinces and the ornamental toys are largely sold in nearly all the towns of the province.

WOOD CARVING IN WESTERN INDIA

Unlike Punjab and United Provinces, wood work in Rajputana, Central India, Sind

and the wide range of the country near about do not show a marked proficiency, in fact the style may be described as of a very elementary character almost a revival of the aboriginal art. In these tracts of the country stone work attained a high proficiency and appears to be the craft of a highly cultured race who turned their attention to wood work after applying their skill to stone. The style in wood work developed more as we go to the South and in Bombay the Jain and Saracenic styles as distinct from Chalukyan and Mahratta styles attained some proficiency. It is most difficult to convey a right conception of the ornamental wood work in the small space at our disposal. Of the minor works teak wood carved brackets and other cabinet maker's productions of the present day are more famous.

WOOD CARVING IN THE SOUTH

Passing to further South we find in Mysore and Coorg a powerful art influence of the Chalukyan style of wood work which originated with the Kalyan Dynasty of Hindu Kings in the 6th century. The art was subsequently converted into productions of a

mixed form of Hindu and Chalukyan art which has preserved its original art conceptions even to the present day. The Chalukyan art was at first confined to a decorative and ornamental style which was subsequently converted to the productions of conventional statuary intended to portray celestial forms in temples and other sacred places. In homestead, however, the ornamental side of the art was preserved as is evident from the bracketed pillars and massive over door frames with niches and idols still found in many of the ancient buildings in the Southern Presidency.

THE DRAVIDIAN STYLE OF WOOD CARVING

From the field of influence of the Chalukyan style of wood carving we pass on to the Dravidian style as we proceed to review the wood productions of the Madras Presidency. Of this style we find some very significant products of admirable carving. But "perhaps the most significant feature of these monuments," we quote from an experienced writer, "may be said to be the effort expended by their designers to force admirations through the display of inordinate human

labour in place of scientific and artistic skill " And the defects of the style are summed up in the following " They are " continued the same writer, ' not constructed on any pre conceived plan The effects of proportions and of light and shade are utterly disregarded For example, in the mouth of a Yali (or lion shaped demon) the tongue may be so cut from the solid rock that it can be moved while it cannot be extracted from between the teeth A chain of many free links may be formed out of a stone, five or six feet in length and then uselessly suspended from the ceiling A *rath* or carriage for the God may be hewn out of a huge boulder so that its wheels may be turned round by the hand although the carriage cannot be moved upon them ' The writer further continues " Equally absurd is the present day effort at marvellous productions consisting in a carving that can hardly be seen with the naked eye (a statue of Krishna cut from a tamarind seed), " The Lord's prayer " inscribed in a grain of rice or a table mat constructed of grains of rice, superfluity of labour thus made to take the place of intelli

gent and rational skill This feature permeates the Dravidian arts "

WOOD WORK IN BURMA

In Burma wood work has attained a high degree of proficiency specially in the construction of wooden edifices in which the natural resources of the country led to a great development of the art of ornamentation in wood work Teak wood is very abundant in Burma and this naturally helped the people in realising their aspiration in artistic houses and as a matter of fact wood carving in Burma has advanced even beyond necessity And here a triumphal arch may be found to be covered with a faithful representation on wood of a "profusion of vines and other flowers, with birds and squirrels resting on twigs within its tracery which can be looked at not only on both sides but along the edge and through and through and still every detail remains vivid and life like "

WOODEN TOYS

The manufacture of woden toys is another industry that demands our attention Lacquered toys of the United Provinces,

Mysore and Rajputana enjoyed wide reputation but the industry is now greatly depressed due to the advent of cheap imported toys. Along with this attention need be paid to the development of artistic wood carving for furniture and cabinet work. All attempts of making fret work and inlaying with other woods or ivory should be helped by all possible means while engraved, inlaid and veneered sandal wood and papier mache, wooden ornaments and models, engraved fruits, etc., will make profitable occupation for many an unemployed artisan.

INDIAN CERAMIC WORKS

LIKE metal, stone and wood works, ceramic works of India did not achieve a wide fame. But the potter's craft of India in some branches attained an unrivalled beauty which attracted the admiration of critics. Of the ordinary works unglazed plain pottery and unglazed painted and stained or varnished works had and now have extended use among all classes of people. Glazed pottery was in common use among the rich men for decorative works, and climax in potter's art in India was attained in the manufacture of decorated wares in cement and plaster of Paris. Thus the Indian ceramic art found expression in clay modelling and plaster of Paris and cement work.

CLAY MODELLING

The various forms of Indian clay modelling both unglazed and glazed, give much food for an interesting study. And workmanship displayed in this branch of pottery is such as to attract admiration from all and the patterns

adopted by the village potters of such places as Bhowalpur, Alwar, Gujranwala, Aligarh wrought with classic like designs are most appreciated by the middle class people. A higher art is manifested in these forms of pottery when the designs are incised or carved on the half dry surface and then coloured and varnished. There are many places in India that have a high reputation for this kind of colouring such as Sewan and Khulna in Bengal, Azamgarh and Aligarh in the U P, Ratnagiri in Bombay, Madura in Madras, and Tavoy in Burma. The artistic clay models of Krishnanagar in Bengal and Lucknow in U P appeal to the fastidious taste of the purchasers. Lac coating is another feature of these forms of pottery and these are done by smearing unglazed pottery, after being fired, with lac and other substances to make it impervious to fluids. Besides these, there is another form of pottery throughout Upper India, as also in Madura and Salem in South India, the painted pottery, from which, according to a Western authority, much of the modelling and painting of India has been evolved.

This is intimately connected with the production of idols and other sound objects and with the frescoing of the walls of temples and houses

GLAZED POTTERY

Glazed pottery of India, of which Peshawar, Lahore, Multan, Delhi, Jaipur, Ajmer, Halla, Jubbulpur, Allahabad, Mirzapore, Raniganj, Vellore and Malabar, are some of the noted places of manufacture, had a peculiarity of choice of colour and designs of their own but owing to the onslaught of unrestricted foreign competition the art is deteriorating. The prevalent form now is green and pink on a milky white but in the earlier work the patches of colour were assorted so as to give, at a distance, the effect of bunches of flower. Of the Peshawar potteries of this class the glazing seems, however, to have improved and the pottery has come much more largely into competition with the imported Russian, Chinese, Dutch and English goods for which there is a large local demand. "Pottery," remarked Sir George Watt, "is so extensively used in Peshawar that it would seem desirable that

every effort should be made to educate the local potters in the higher flights of their craft with a view to checking the imports. It has been pointed out that one of the chief difficulties in this direction is the restrictions imposed on the sale of lead by the local authorities."

ARTISTIC POTTERY OF HALLA MULTAN

The artistic pottery of Halla Multan, Sind originated with the production of tiles and for centuries lived through the demand for such goods. Some few years the potters of Multan, doubtlessly dictated by the vicissitudes of trade, decided to imitate the greens yellows and browns as well as the blue, on a blue background with disastrous result. The depths of blues and whites of Multan which was the glory of the evolutions of centuries of patient study and discovery, has been effaced and the work of to day is slovenly and dull.

DELHI POTTERY

The pottery of Delhi is not made of clay but of ground plaster mixed with gum or starch. It cannot in consequence be made on the potter's wheel but has to be moulded or wielded by the hand.

PLASTER OF PARIS OR CEMENT WORK

Now to turn to plaster of Paris and cement work. Many a place in India is famous for its marble like cement work. "This is made," we read in an authoritative book, "with lime mixed with sand and either plaster of Paris or powdered marble and very often sugar or some glutinous substance such as the gum from the *bel* fruit, when patiently beaten and smoothed almost until quite set, it assumes a remarkably hard consistence and an exceedingly fine polish, and when quite dry is usually most elaborately painted and gilded. In India we have gypsum in abundance, yet except as an ingredient of certain plaster of Paris it does not appear to have been ever used by our countrymen as a moulding material. Of pure plaster of Paris work some admirable specimens are found in statute works of several sculptors.

OCCURRENCE OF WHITE CLAY

From the report of the Geological Survey of India it appears that the suitable white clay for the manufacture of pottery can be extensively found in most of the Indian States

S 1 1 8

The Gwalior State took the foremost position in making experiments in pottery industry by employing the services of experts returned from Japan. Decorated tiles have been turned successfully out of *bela-clay* discovered in the State. The Baroda State also is rich in white clay for the manufacture of pottery. From the report of the mineral resources of the State it appears that a very nice white clay, exactly resembling Cornwall China clay has been found near Ransipur, on the river Sabermati. The deposit is estimated at about 70,000 tons. An analysis of the sample shows that the best porcelain ware can be manufactured out of it. Other necessary raw materials, which will be required in the manufacture, can be found in the State. In the Kathiwar Provinces there are deposits of white clay just suitable for the manufacture of earthenware without mixing any other material to satisfy the composition. The best kaolin has been found out in the provinces of Cutch and Bhuj while Tipperah State and Bhagalpur District have been recently found to contain good deposits of kaolin.

THE POTTER'S WHEEL

The low economic condition of the potters and clay modellers is mostly due to the defective construction of the potter's wheel. It slows down very rapidly and after a few rotations the wheel begins to oscillate and renders the moulding of articles of finer and thinner sections, on account of the instability arising from unbalanced inertia forces, a most difficult affair. The wheel is also not well suited to the making of larger vessels. It is encouraging to learn that a device has been planned by the Industrial Engineer, Department of Industries, Bengal to remove this drawback. The design provides a bicycle free wheel device which makes it possible for the wheel to move along with a stone block mounted coaxially. With little effort the wheel gets up to desired speed and continues to rotate without any swerving for a long time. Another advantage of the wheel is that the speed of the wheel can be increased or decreased at will. This is bound to offer a great stimulus to the ceramic industry of India. But the question of developing the pottery in

dustry cannot be successfully tackled until a suitable kiln is evolved for burning the articles that are moulded on the wheel. The uneven co-efficient of expansion of the clay and the glaze causing cracks on the products is to be overcome first. Success in this direction will render the ceramic industry a thriving cottage industry giving employment to even the women who are eminently fitted for the craft because of the delicate touch they are capable of imparting to the products during moulding

ART ENAMELLING IN INDIA

OF all the beautiful arts for which India may be well proud, enamelling and mille works are no less worthy. These may be described as the art of colouring and ornamenting the surface of the metal by fusing over it various mineral substances. Success depends on the skill and resources of the operator and the materials employed. The range of colours attainable on gold is much greater than on silver and still more so than on copper or brass. This peculiarity is to a certain extent overcome by silvering or gilding the surface intended to be enamelled. There are known to exist three or four forms of enamelling such as the *cloisone* in which wires are fastened by a gum or simply impinged or in others welded to the surface of the metal in elaboration of the design, much as in some forms of filigree. The various spaces thus outlined are next loaded with the colouring materials, and the article placed in the furnace until the glasses fuse, when the purpose of the wires becomes

apparent, namely, to save the various colours from being intermixed and the design thereby hopelessly destroyed

The second form is known as *champlene* in which the metal is engraved or chased, repoused or blocked out in such a way as to provide depressions within which the colours can be improved. In Jaipur, Kutch, Bhawalpur, Delhi, Lucknow, Benares and Rampur and other towns of India the patterns are chased, in Kashmir repoused and in Multan it is blocked out by means of dies

Another mode which is prevalent in most parts of Kashmir is to paint the surface with a sort of silicated or readily fusible paint and then subject the article to a moderate heat sufficient to melt the paint but not to cause the colours to fuse together

THE FLUX

The flux used is invariably borax, tin oxide being added to lower the required temperature but with the further result of making the glass or enamel opaque. The colours are silicates and borates of the metals, the chief being a yellow, produced through the use

of chromate of potash; violets through carbonate of manganese, blues through cobalt oxide; greens through copper oxide; browns through red iron oxide; blacks through cobalt-copper, manganese and red iron oxides being used along with a glass composed of 100 parts of quartz, 50 borax and 200 red lead. The brilliant reds attained by the Jaipur, Delhi and Benares workers on gold are the more difficult of all colours to produce and their secret is therefore more or less rigorously preserved. White or ivory colour is also difficult, but is obtained from antimoniate of potash, hydrated iron oxide and carbonate of zinc added to the ordinary glass.

THE PROCEDURE.

The resources of the jeweller are limited, though his results are often extremely beautiful. His furnace is very small and his methods of heating defective, hence comparatively small articles only can be enamelled, the colours being applied time after time, those that can stand the greatest amount of heat being first used and the others in order of their fusibility.

ANOTHER METHOD

Most of the above facts are collected from Sir George Watt's writings on the subject. Colonel T H Hendley, C I E, has published a most interesting account of the art of enamelling. He tells that the engraving is done with steel styles and the polishing is completed with similar tools. The surface of the pits in the gold is ornamented with hatchings, which serve not only to make the enamel adhere firmly, but to increase the play of light and shade through transparent colours. The enameller or *munaker* now applies the colours in the order of their hardness, or power of resisting fire, beginning with the hardest. Before the enamel is applied the surface of the ornament is carefully burnished and cleansed. The colours are obtained in opaque vitreous masses from Lahore where they are prepared by Mahomedan *manikers* or bracelet makers. The Jaipur workmen state they cannot make the colours themselves.

ENAMELLING IN JAIPUR

The style of enamelling that is executed in Jaipur stands, according to Sir George

Watt, pre eminent in India—the oldest and best school of work though within recent years the most skilled artificers have removed to Delhi. The work is done invariably on the purest gold (22 carat) and the plate is so engraved that all but the faintest lines of the metal disappear and the entire surface of the metal becomes as it were a sheet of translucent enamel.

ENAMELLING IN BHAWALPUR

Bhawalpur also has long enjoyed the reputation of being an important centre for gold enamelling. The enamellers of Bhuj have recently attained high proficiency so much so that “a sample of their work will be seen to equal, if not excel, the finest enamelling of Europe.” In Benares, the art of enamelling seems confined to the production of large patches of colour in imitation of jewels rather than in the elaboration of a floral or other designs that could be regarded as a distinct style of enamelling. Usually the enamel is employed to give the ground colour required in the production of gold and jewelled ornaments such as *pachisi* makers and the design

is produced with diamonds or the stones set within coloured field

ENAMELLING IN LUCKNOW AND RAMPUR

Lucknow and Rampur are two other towns noted for their enamels. The prevailing feature is an etched pattern on silver in which green and blue with a small patch of yellow and brown enamel is given. The etching is so minute and at the same time so abundant as to give the ornamented article, when viewed at a distance, the appearance of being corroded in verdigris. The absence of a back ground or any well marked scheme of composition or colour, renders this style of work distinctly inferior in artistic merit to any of the other Indian schools of enamelling. It is, moreover, burdened with animal forms to an extent perfectly astonishing, seeing that it is for the most part made by Mahomedans and sold to Mahomedans. It is, at the same time, by no means cheap.

ENAMELLING IN PARTABGARH

In Partabgarh, in Rajputana, a peculiar style of work is practised that has been spoken

of as a form of enamelling The article is made of a piece of green or red coloured glass, or thick layer of enamel, the crude material for which is imported from Kashmir A frame or silver wire, of the exact size and shape of the glass, is next made and across this is attached a sheet of fairly thick gold leaf This is then embedded on lac and the pattern punched out and chased on the gold The glass is then semi fused, and while still hot the rim of silver and film of gold are slipped *over the edge and pressed on to the surface of the glass* The article is again heated, until a sort of fusion takes place and the gold and glass become securely united Before mounting the article a piece of silver tin foil is placed underneath the glass to give it brilliancy

INDIA'S BRASS AND COPPER CRAFT.

MANY admirers of Indian handicraft visualize the establishments producing attractive brass and copper wares as modern in equipment, with surroundings which tend to stimulate the workers to aesthetic production. This, however, is not the case says **COMMERCE REPORTS**. The great bulk of India's handicraft production is laboriously hammered out or fabricated with the crudest of tools, by poor workers in mud thatched huts, surrounded by their families, their chickens and their cows. Such a setting is typical of Indian cottage industries and from such an origin come the graceful brass and copper vases, bowls and images found in the homes, retail stores, art galleries, and museums.

INDIAN BRASS WORKERS

In India only two castes devote their full time to the manufacture of brass and copper ware, neither of them very high in the social scale. The individuals comprising them are

extremely poor and, as a rule, unable to finance their own operations. The Indian dealer goes to the artisan with money in hand, and after spirited bargaining as to price, quality, and quantity of goods to be supplied, is required to make payment in advance. If this payment happens to be of considerable size the Indian merchant maintains a sharp lookout until the contract is fulfilled.

THE NUMEROUS VARIETIES

Indian brasses and copperware range in size from small chain bangles, costing but a few pice and worn everywhere by Indian women of the lower classes to large statues with religious significance, found at shrines and holy places throughout the land. Between these extremes lies the range of domestic and sacred utensils manufactured in practically every village in India. Nearly all the eating or drinking vessels of the average Indian family are made of copper or of brass. Lamps, salvers, waterpots, often of noble design, are beaten out of a single sheet of metal and the intricate decorations on them are cut in with a cold chisel.

SPECIALIZATION IN DIFFERENT CITIES

As might be expected, considerable diversity of knowledge and skill is shown by Indian craftsmen in the utilization of the various metals and alloys employed, and in order properly to evaluate individual pieces one must have a fair knowledge of the trade. While certain types of brass and copper wares are produced all over India each section has its own style, so that one versed in such matters recognizes the origin at a glance. Burma, for instance, leans toward the production of enormous brass figures, cast in foundries almost utterly lacking in equipment, the work being done by a mere handful of men.

Benares is perhaps the first city of India for the multitude and excellence of its cast and sculptured images and for ceremonial utensils of brass and copper. The industry arose naturally from the demand centering about the numerous temples of the city. The precincts of these places of worship have been converted into bazaars, where stalls are heaped high with every type of brass ware to attract worshippers.

JAIPUR'S POLISHED BRASSES

In Central India several centres, the most important of which are Jaipur, Bikaner, and Indore, are noted for their craftsmanship. At Jaipur, where brasses are more conscientiously made and cheaper than in most other parts of India, the trade has increased immensely in the past few years. Jaipur specializes in polished brasses with richly engraved designs, often of modern arabesque such as is found in the famous Jaipur tables.

Poona, Bombay, and Baroda are also noted for certain types of work. Bombay has an active industry which specializes in the manufacture of pots and pans for use locally and for export. The copper bazaar of Bombay is the busiest and noisiest and one of the most interesting of the Indian quarter.

ARTISTIC DESIGNS IN MADRAS PRESIDENCY
AND KASHMIR

Everywhere in the Madras Presidency metals are well wrought but the products of Madura and Tanjore are the finest found in India. The style is of elaborately inwrought design, with bold form. Some pieces are

simply etched, while others are deeply cut with mythological designs. Some are incrustated with leaf patterns, with copper on brass or silver on copper, producing effects very pleasing to the eye.

In Kashmir tin is soldered on copper which has been deeply engraved with a floral design, and the sunken part filled with coloured enamels. The whole is then studded with small, raised flowers which shine like frosted silver against a background of foliated scrolls, so delicately traced as to appear like lace.

LITTLE STANDARDIZATION IN BRASS MANUFACTURE

Because of the nature of the brass and copper industries of India, data for the annual volume of business, or the quantity exported are not obtainable. Exports are growing fast, however, as the residents of foreign countries are coming to know and appreciate Indian artisanship in these metals. At present it is rather difficult for the foreign importers to purchase brass and copper ware in quantity, as the multiplicity of articles, designs, and the varying degrees of workmanship and sizes

make listing in catalogues or price lists almost an impossibility. There is practically no one in India who manufactures a certain number of copper pots, for instance, in exactly the same size, weight, or design, and few who could undertake to specify delivery of a certain quantity at a set price. Where purchases by wholesale are made considerable confidence must exist between the Indian exporter and the foreign importer.

LARGE IMPORTERS HAVE RESIDENT BUYERS

The large importers usually maintain resident buyers in India, who visit the producing centres and buy from the producers themselves, or from those Indian merchants who may carry representative stocks. The principal firms in Bombay dealing in and exporting artware and curios maintain resident buyers in Moradabad, Jaipur and Benares who buy from the smaller middlemen or from individual craftsmen. These buyers keep in close touch with workers in metals and usually have a certain following which they have found to be reliable. The requirements of Bombay firms are usually for certain types, leaning

toward standardization, but when special pieces are required the buyer often superintends their manufacture. The commoner types of brass ware may be produced on the basis of weight, but articles requiring exceptional skill are usually paid for by the piece.

UTENSILS, TOYS, ETC

Brass toys and idols which are made solid and hollowares form an important industry. It is located at Benares, Mathura, Agra, &c.

Although the use of brass utensils for domestic purposes has been hampered to a great extent by the advent of enamelled and aluminium wares, still it maintains its supremacy in some particular sections as in the days of old.



THE BELL-METAL INDUSTRY

THE bell metal industry is one of the few village industries in India which have not suffered from the competition with imported machine made articles. In spite of the extensive demand for enamelled and aluminium wares the industry still continues to thrive in its important centres, because the average Indian householder still prefers utensils made of bell metal either for everyday use or for making presents on a marriage or other ceremonial occasions. The number of persons who find occupation in this particular industry is correspondingly large and they are supposed to belong to a particular section of the people on the assumption that in India every trade or occupation is carried on by a particular caste, who in general take their name from the business to which they belong. The bell metal industry is no exception to this rule. Theoretically the trade, whether of making or retailing the articles of bell metal, is entirely in the

hands of the *Kansaris Kaseras*, etc , the hereditary bell metal workers But practically, as has already happened in nearly every purely occupational caste, a number of men from other castes has come in and taken up a business not strictly theirs

This development of the bell metal trade among workers of alien castes can be accounted for only by two reasons, first the business is so lucrative that the scruples of caste have to go to the wall, secondly, the pressure of population is so intense now a-days and the struggle for existence is so hard, that amid the general weakening of caste principles by education and European ideas, men will take themselves irrespective of caste to any trade that will furnish them with their daily necessities

CHIEF CENTRES OF MANUFACTURE

The more important centres of manufacture of this indigenous industry of the province of Bengal are Kamarpara, Dainhat, Purbas-thali (Burdwan), Bankura, Vishnupur, Kharar, Ghatal (Midnapore), Khagra (Murshidabad), Santipur, Ranaghat, Navadwip (Nadia), Englishbazar, Nawabgunj (Malda), Islampur,

Khagmarī (Mymensingh), Budhpara, Kanāī khālī, Kalam (Rajshahī), Fīrrīngībazar, Abdullahpur, Shologhar, Dhamraī, Thatarī Bazar (Dacca), Palong (Farīdpur), Gomnatī and Rangpur

Of these places Vishnupur, Khagra, Englishbazar, Islampur, and Khagmarī are famous for high class manufacture and artistic skill

THE INGREDIENTS

Bell metal of superior quality is an alloy composed of 4 parts of copper and 1 of tin. The characteristic feature of this alloy is that it is not affected by acids. For this reason domestic utensils made of it are much prized. Owing to the high polish which it will take, this alloy is also largely employed in the manufacture of ornaments worn by the poorer section of the people of Northern India.

THE IMPROVEMENT

While the ignorant bell metal workers of our country have continued the process and the constituents of the alloy handed down to them by their forefathers, metallurgical science in the non ferrous alloys has made astonishing progress in the western countries.

To cheapen the first cost without impairing the quality the expensive tin is replaced with a certain proportion of zinc and a trace of aluminium is used when melting the alloy in the crucible. Experiments conducted on this line by the Department of Industries, Bengal show a marked economic improvement on the methods prevalent in the ordinary bazar.

In the first place the cost of the constituent metals is cheaper by 35 per cent, than the old fashioned formula using copper and tin only. Secondly, an article of the same quality is produced which, because of its constituents, is 6 per cent lighter, even though the articles are of the same size and thickness as the bazar made articles. Lastly, the fluidity of the alloy at normal moulding temperature is so greatly improved that the homogeneous condition of the resulting casting gives better consistent results than are obtained in ordinary practice.